ARTMENT ... CHNOL
AND ERIE COUNTY PUBLIC L...

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

AND EVER SO STYLISH

San Francisco passersby do a "double take" when Reginald Ohlssen, Pacific T&T cable splicer, is on the job. Company regulations require hard hats, so Ohlssen sports a non-collapsible silk topper purchased at a church bazaar. —Photo, courtesy San Francisco News.

Guaranteed Circulation This Issue
11,944, of Which 11,413 is Paid

ELECTRONICS SECTION—Page 27

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

When you buy telephones . . .

CHOOSE THE MOST COMPLETE LINE!

You can meet your subscribers' needs for standard and special-application instruments better with the Stromberg-Carlson line than with that of any other independent manufacturer.

In the table at the right note how the Stromberg-Carlson line fills *25 of the 26 customer needs listed.* Manufacturer "A" may meet up to 11 of the requirements . . . manufacturer "B" no more than 12.

All Stromberg-Carlson telephones—regardless of application—have met the rigid test of use in terms of rugged construction, trouble-free operation, maintenance economy and handsome styling.

SUBSCRIBER'S NEED
1. Moisture-proof, concussion-proof, weather-proof telephone for use out doors or in underground localities. Magneto type
2. Moisture-proof, concussion-proof, weather-proof telephone for use out doors or in underground localities. Dial type
3. Self-contained desk type magneto telephone
4. Self-contained wall type magneto telephone
5. Magneto desk set box. (May be used with 1544 or 1534-M telephone t make a 2-piece set.)
6. Desk set telephones with multi-line push buttons. For use with interio systems
7. Suspended handset type telephone for use where space is at a premiu (manual and dial instruments)
8. Suspended handset type telephone. Complete instrument with A.C buzzer for signal (manual and dial instruments)
9. Suspended handset type telephone for flush mounting on wall. Com plete manual instrument with A.C. buzzer for signal
10. Suspended handset type telephone without induction coil-capacitor un or signal. For use with desk set box
11. Standard desk telephone in modern styling
12. Standard "battery saver" desk telephone with 2-step hookswitch. Pe mits subscriber to monitor party line
13. High-efficiency desk telephone with 10 DB more gain than standa model
14. High-efficiency desk telephone with 2-step hookswitch
15. Desk set box for use in making a 2-piece set
16. Extension bell box using ringers or buzzer. Commonly used with 2-li telephone
17. 2-line telephone with hold feature on both lines. Third line provides f intercom or local PX service
18. Standard type desk telephone with push or twist type key
19. Multi-line telephone used with "6K System" has 6 keys: 1 for holdi 5 for central office, PBX, intercom, or private lines
20. Hands-Free telephone. Can be used "hands-free" or as conventio instrument
21. Electronic telephone for locations with high noise levels
22. Pay station telephone
23. Desk set telephone less ringer, less coil-capacitor unit
24. Colored telephones in 8 colors
25. Desk set convertible to wall telephone
26. Colored telephones less ringers

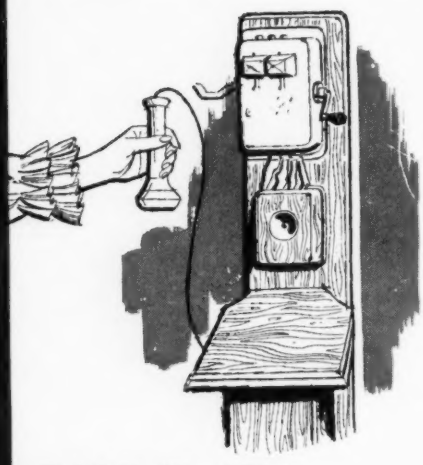
It pays to standardize on Stromberg-Carlson instruments!

STROMBERG-CARLSON	Company A	Company B
Yes (890)	Yes	Yes
Yes (950)	Yes	Yes
Yes (1248)	Yes	Yes
Yes (1258)	Yes	Yes
Yes (1268)	Yes	Yes
Yes (1270, 1272)	No	No
Yes (1532, 1532-M)	No	Yes
Yes (1533, 1533-M)	No	No
Yes (1533-MK)	No	No
Yes (1534)	Yes	Yes
Yes (1543)	No	No
Yes (2-1543)	No	No
Yes (1543-W)	No	Yes
Yes (2-1543-W)	No	No
Yes (1560)	No	No
Yes (1561)	No	Yes
Yes (1573)	No	No
Yes (1574)	No	No
Yes (1575)	No	No
Yes (1584)	Yes	No
Yes (Gai-Phone)	No	No
No	Yes	No
Yes (1544)	Yes	Yes
Yes	Yes	Yes
Yes	No	No
Yes	Yes	Yes

STROMBERG-CARLSON COMPANY

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco



BACK IN 1869

when telephones were scientific novelties, our first warehouse was opened.

FOR 88 YEARS

Our organization, founded by Ell and Enos Barton, has served as the First Co and equipment for Independent Telephone Co

Graybar's history dates back to the very beginning of the telephone business. Graybar has grown up with the problems of the communication industry and has a working familiarity with them. The men you deal with at Graybar are men who have virtually been IN the telephone business all of their professional lives.

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

GRAYBAR ELECTRIC COMPANY

420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

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TODAY,

in over 130 principal cities, offices and warehouses of Graybar Electric Company serve Independent Telephone Companies in every State in the Union.

l bElisha Gray

FirSource of supplies

onCompanies

NATIONALLY KNOWN MANUFACTURERS ARE GRAYBAR SUPPLIERS

When you order Telephone Supplies and Equipment from Graybar you choose from the products of more than 300 first-line manufacturers. Quality products,—field-proved!

WELL-STOCKED GRAYBAR WAREHOUSES ARE READY TO SERVE YOUR ROUTINE AND EMERGENCY NEEDS

When you contact your nearest Graybar office and place an order for vitally needed telephone equipment and supplies, you know that your deliveries will be made promptly from Graybar's constantly maintained stocks. Graybar's conveniently located warehouses can cut your own storage of spare and emergency equipment to the minimum.

GRAYBAR TELEPHONE SPECIALISTS PROVIDE EXPERIENCED HELP

Special training, wide field experience and constant contact with leading manufacturers qualify Graybar Telephone Specialists to give you dependable consulting help with every special problem that comes up.

GRAYBAR IS OWNED BY THE MEN AND WOMEN WHO SERVE YOUR NEEDS

Because Graybar Electric Company is wholly owned by its operating and retired personnel, we, too, are proud of being an Independent Company. Every one of us will welcome your inquiries and your orders, for "Everything Electrical",—in telephony and otherwise. 734-235

Call Graybar first for...

GraybaR QUALITY *Everything in Telephone Supplies*

IN OVER 130 PRINCIPAL CITIES

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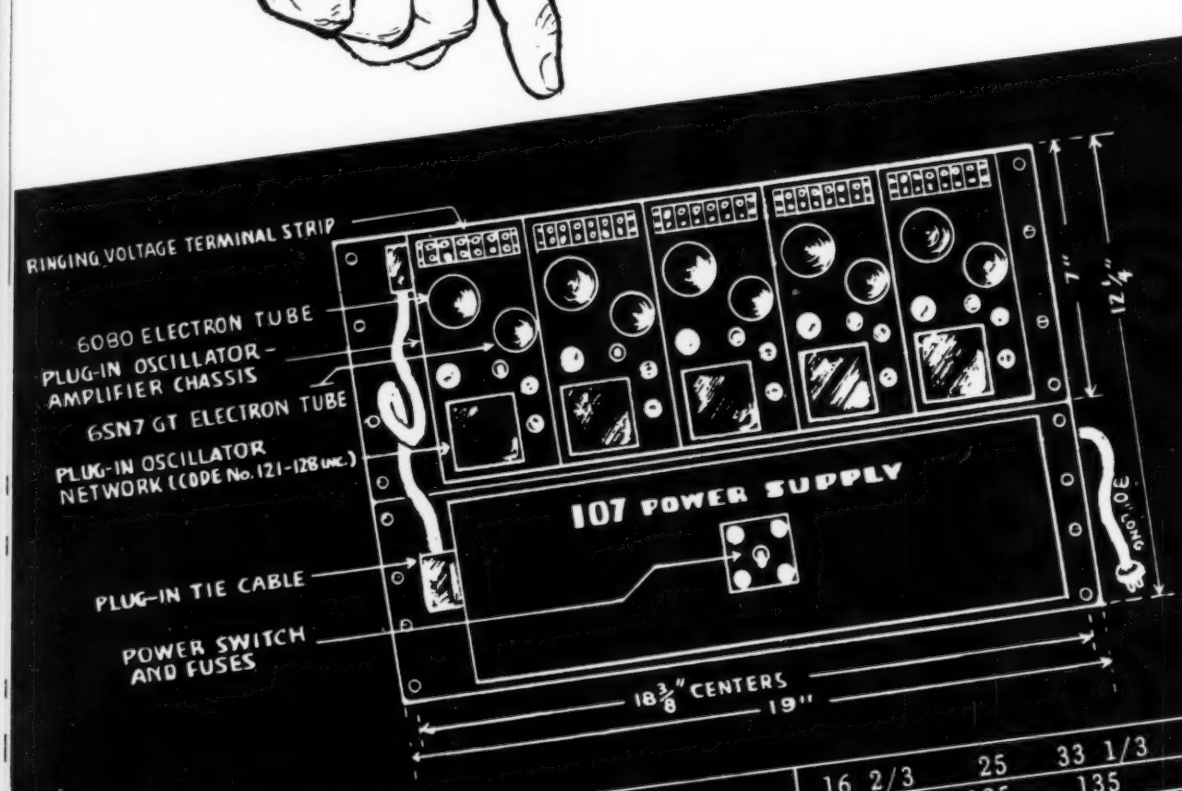
Modernizing? Cutting maintenance costs? Then l



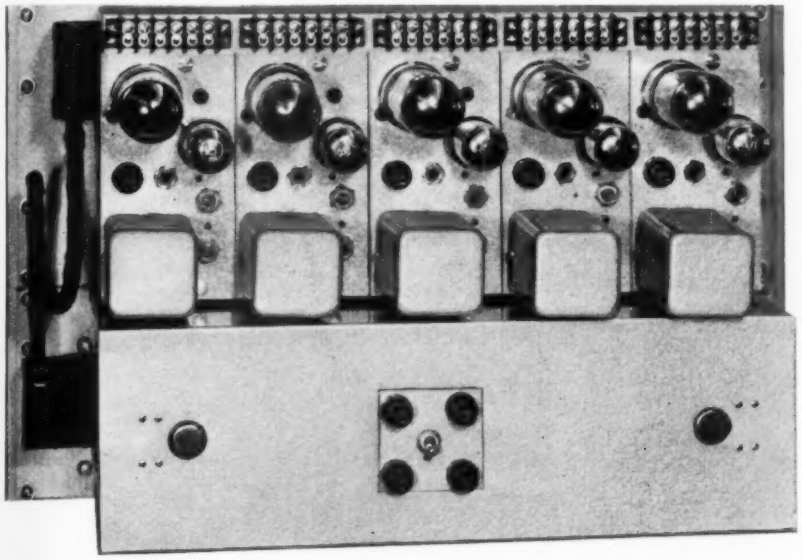
Code No. 101 Harmonic	Frequency	16 2/3	25	33 1/3	50	66 2/3
	*Nom. Ring. Volt.	105	125	135	145	155
	Osc. Net. No.	121	123	124	126	128
Code No. 102 Synchromonic	Frequency	16	30	42	54	66
	*Nom. Ring. Volt.	105	125	135	145	155
	Osc. Net. No.	121	124	125	126	128
Code No. 103 Decimonic	Frequency	20	30	40	50	60
	*Nom. Ring. Volt.	105	125	135	145	155
	Osc. Net No.	122	124	125	126	127
Code No. 104 Special	Frequency	20	30	42	54	66
	*Nom. Ring. Volt.	105	125	135	145	155
	Osc. Net. No.	122	124	125	126	128

*Voltages adjustable from values indicated.

Any combination of five ringing frequencies available on special order.

...en look at the advantages of the

KELLOGG ELECTRONIC RINGING GENERATOR



Write for your copy of the bulletin on the Kellogg Electronic Ringing Generator, today!

More and more independent telephone companies are adopting the Kellogg Electronic Ringing Generator as standard equipment. Here are a few of the many reasons:

- **LESS MAINTENANCE** . . . No moving parts . . . no contacts to clean or replace. Plug-in components . . . not damaged by shorted lines...experience proves tube life normally exceeds 18 months.
- **NO CROSS-RING PROBLEMS**...Extreme frequency stability . . . precise, easily adjustable frequencies.
- **FLEXIBILITY**...Provides any combination of 5 or fewer ringing frequencies. All ringing frequencies are independent of each other and/or frequency of power source.
- **EFFICIENT** . . . All frequencies continuously available . . . furnishes enough power for 1000 or more lines.
- **COMPACT** . . . Mounts on standard 19" relay rack...requires only 12¼" of vertical space.

DID YOU KNOW THAT

Kellogg was the first to make available a successful commercial Electronic Ringing Generator in its present form?

KELLOGG
A DIVISION OF I T & T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
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Riverside 7-5191

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Mansfield, Ohio
Mansfield 7-2816

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International Standard Electric Corp.
50 Church Street
New York 7, New York

1594 Southland Circle, N.W., Atlanta, Georgia, Sycamore 4-2441 • 504 County Bank and Trust Bldg., Passaic, New Jersey, Prescott 9-3610

FLASHES AND PLUGS

THE SCALES OF JUSTICE. A strange retribution fell on a thief in Sunderland, England recently. The United Press reported that he locked himself in when he broke into a local store, and had to call police to get him out.

•

TOLL CALL. You've heard versions of this story before, but according to the Associated Press, this one actually happened:

A public polio inoculation program in Oklahoma City saw thousands of persons queued up in assembly-line fashion for shots.

A man, with his shirt sleeve rolled up and a wad of cotton over his injection wound, wandered up to one of the medical assistants.

"All I was doing was looking for a telephone when I got pushed into a line and jabbed," he moaned.

•

HAPPY LANDING. A woman in Ottawa, thrown from an overturning car on the highway flew 20 feet in the air and dangled on telephone wires for eight minutes according to the *Associated Press.*

Several ribs were broken when she hit a telephone pole crossarm in flight. But when she dropped from the wires, she suffered no further injury.

•

UNKINDEST CUT. Attorney John F. Molloy objects to the way the telephone company has his name listed in the new directory, reports the *Chicago Daily News.*

He says the "atty" designation after his name makes it read: "Molloy, John F atty" and it looks like "Fatty." He asked that "something be done about it."

•

INSIGHT. *Illinois Bell Telephone News* in its latest issue reports an interesting viewpoint with the following background:

"It's quite customary for students to write thank-you letters to the telephone company as a class assignment following a demonstration. Included in such a packet resulting from a Teletrainer session was this gem:

" 'I especially learned a lot about things you don't realize you are doing until you see someone else is doing them.' "

•

FOREST PRIMEVAL. The bright pupil looked long and thoughtfully at the second examination question, which read:

"State the number of tons of coal shipped out of the United States in any given year."

Then his brow cleared and he wrote: "1492—none."

CHANGE OF ADDRESS

Please notify your local postmaster and Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

May 25, 1957

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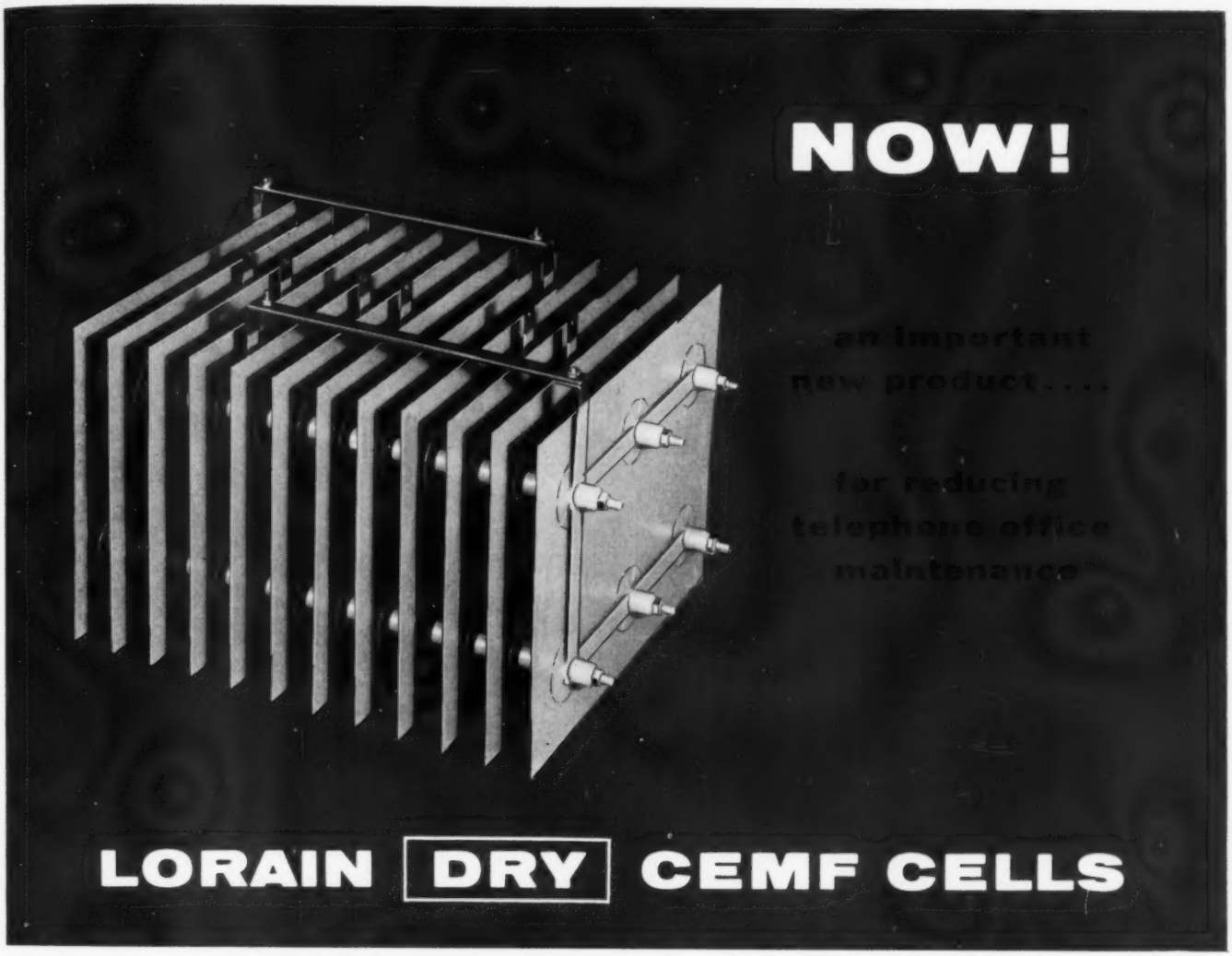

UNRESTRICTED RANGE OF VOLTAGE AND CURRENT RATINGS

- **no routine maintenance**
- **light weight, portable**
- **mounts in any position**
- **not damaged by freezing**
- **non-corrosive**
- **obtainable in any size**

Now available in all sizes, Lorain Dry CEMF Cells eliminate the maintenance problems associated with liquid-filled cells. Their light weight, portability, safety, and their unrestricted range of voltage and current ratings also adapt them for use as voltage regulating elements in many applications in which wet cells could not be used. They do not give off gases, do not employ liquids, are relatively insensitive to shock, and do not require maintenance or periodic attention. Lorain Dry CEMF Cells, therefore, can be installed wherever most convenient, making possible considerable economies in wiring, mounting racks, and floor space.

Lorain Dry CEMF Cells are selenium covered metal plates, specially treated so their internal resistance decreases rapidly as the current flow through them increases, making them effective as voltage regulators. The amount of voltage drop is determined by the number of plates connected in series. Bulletin 176 lists representative sizes; assemblies to meet individual specifications are readily made to order. Specific recommendations will be made upon receipt of the current and voltage limits to be met, and the preferred mounting arrangement.

POWER EQUIPMENT FOR COMMUNICATIONS AND INDUSTRY

our equipment is sold through leading telephone distributors

LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

interested in growth

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Look how toll revenue is growing!

Like the little guy in short pants who suddenly towers over you and wants to know if he can use the car tonight, toll revenue by Independents has grown so big so fast it's almost unbelievable.

QUESTION: *Are you getting your full share of this mounting pile of toll dollars?*

If not, a suggestion . . . let Automatic Electric's carrier and radio engineers help you now in developing your toll circuits, TWX installations, telemetering and other special services that build toll revenue. Our specialists are ready and eager to go to work for you.

Just drop us a line today.

Automatic Electric Sales Corporation,
1033 West Van Buren Street,
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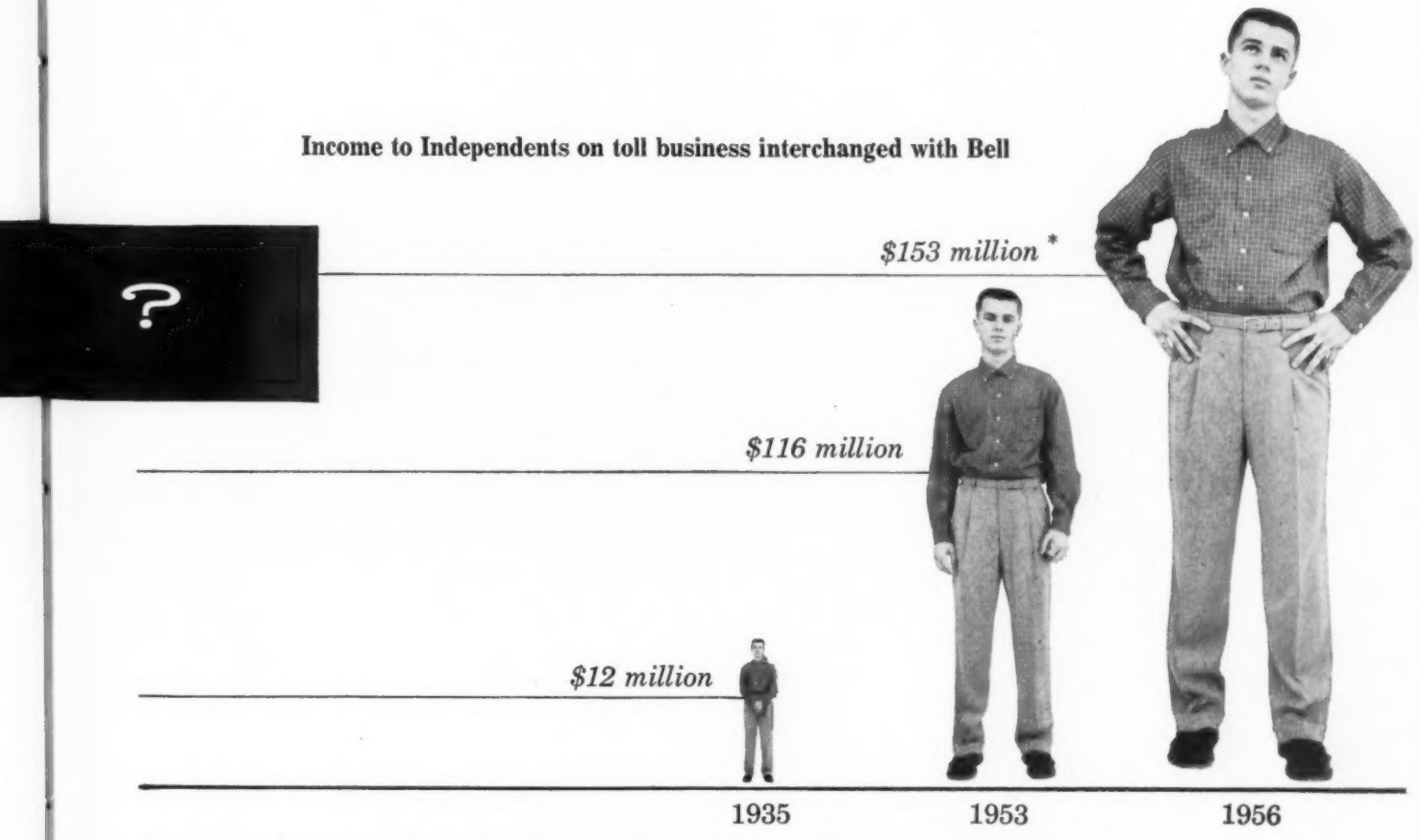
IN CANADA Automatic Electric Sales (Canada) Ltd.,
Toronto, Ontario.
Offices in principal cities.



**Based on "Report of Toll Compensation and Settlements Committee" 59th USITA Convention.*

AUTOMATIC ELECTRIC

A member of the General Telephone System –
One of America's great communications systems

GENERAL TELEPHONE SYSTEM

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Willy went dial in the very worst way.

He didn't know he'd been led astray.

The system he bought—to his lasting sorrow—

Was made for today but not for tomorrow.

His town grew fast, his equipment couldn't;

Now Willy's headed where a smart man shouldn't

MORAL: BUY STROWGER AUTOMATIC—
be ready for tomorrow!

Don't take a chance like Willy. Call in a friendly, dependable Automatic representative today. He'll be glad to help you plan for the future—just as he has helped hundreds of successful telephone men. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7.* *Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

A member of the General Telephone System—
One of America's great communications systems

GENERAL SYSTEM

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Where is the Guy who put up this guy?

He's doing something else—
maybe he's putting up another one.
Anyway, he did this job all alone
in less than five minutes—
by himself.

STRANDVISE is made
for strand sizes 3/16", 1/4", 5/16", 3/8", and 7/16"
NO MATTER THE GRADE.
Please pick your size, fill in
the coupon and mail it today.

Reliable

Reliable Electric Company
West Carroll Avenue
Chicago 12, Ill.

Mr. Reliable:
WE DON'T BELIEVE IT BUT—we want to give STRANDVISE a fair trial. You may send 4 of them size ( ) without charge. Better send your instructions for installing and a catalog-price sheet, too.

Signed_____

Company_____

Street No._____

City_____ State_____

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60 YEARS OF INDEPENDENT TELEPHONY 1897 1957

This STRANDVISE guy was put up complete before any tensioning tools were applied to the strand

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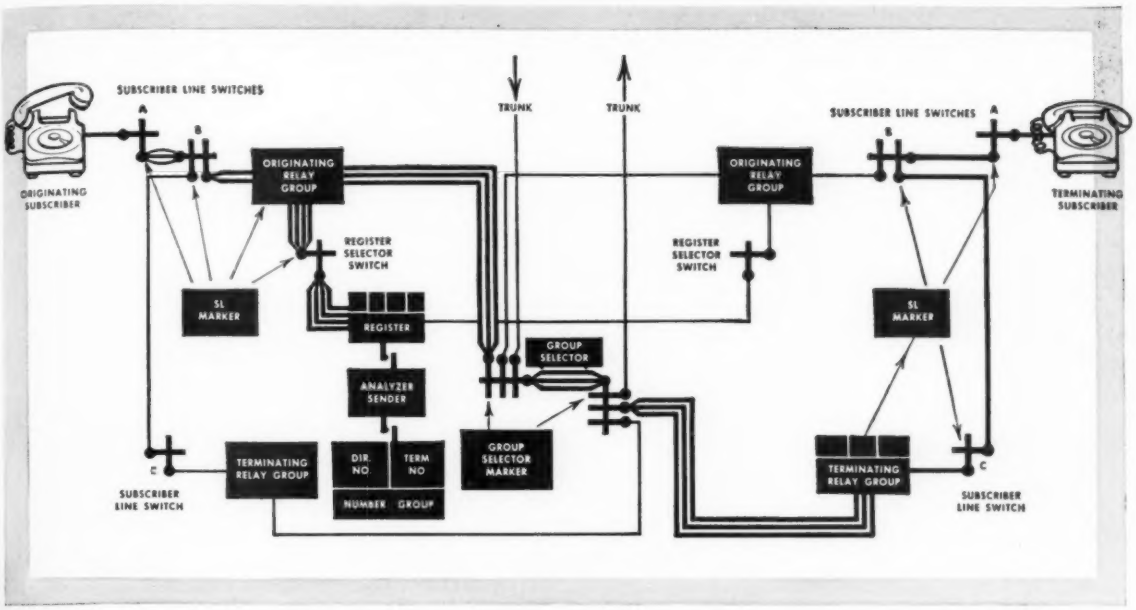
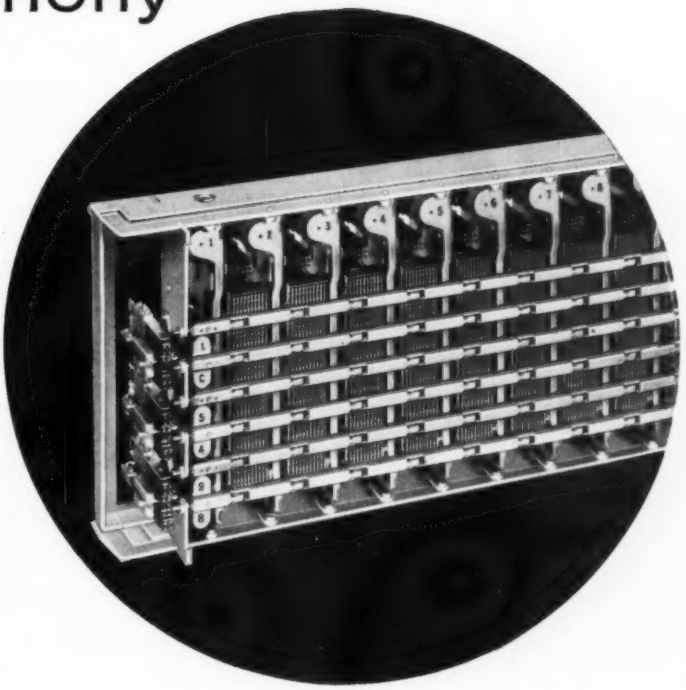
North's expanded production facilities devoted to By-Path Crossbar Switch production are among the most modern in the industry.



NORTH by-path crossbar switching opens the door to modern telephony



North is now producing, installing, and cutting over By-Path Crossbar exchanges all over the United States. North By-Path Crossbar is the answer to tomorrow's requirements TODAY.

North By-Path Crossbar Switching enables you to handle all the advanced telephonic services that are fast becoming standard for progressive exchanges—Direct Distance Dialing, Automatic Ticketing, Automatic Line Identification, Call Meter Service, Traffic Recording, and Automatic Routing.

North By-Path Crossbar will provide speedy, efficient handling of peak traffic loads with an absolute minimum of incompleted calls.

North By-Path Crossbar requires less floor space and is readily expandable.

Tested and approved, in use today, NORTH BY-PATH CROSSBAR is universally acknowledged as the most advanced practical telephony switching system.

NORTH ELECTRIC COMPANY

601 SOUTH MARKET STREET • GALION, OHIO

. . . **BECAUSE** Lenkurt Carrier is the simplest, fastest, most economical way to add profitable new circuits, using present wires. Only with Lenkurt Carrier do you benefit from advanced engineering features like these: direct interconnection at carrier frequencies . . . exclusive "building-blocks" concept of interchangeable, plug-in components . . . utmost simplicity of installation, maintenance and expansion.

. . . **BECAUSE** Automatic Electric offers you Lenkurt Carrier in one complete package—engineered, furnished and installed. We take complete responsibility until your system is operating smoothly.

. . . **AND BECAUSE** Lenkurt Carrier Systems are engineered *by* telephone men *for* telephone company operations.

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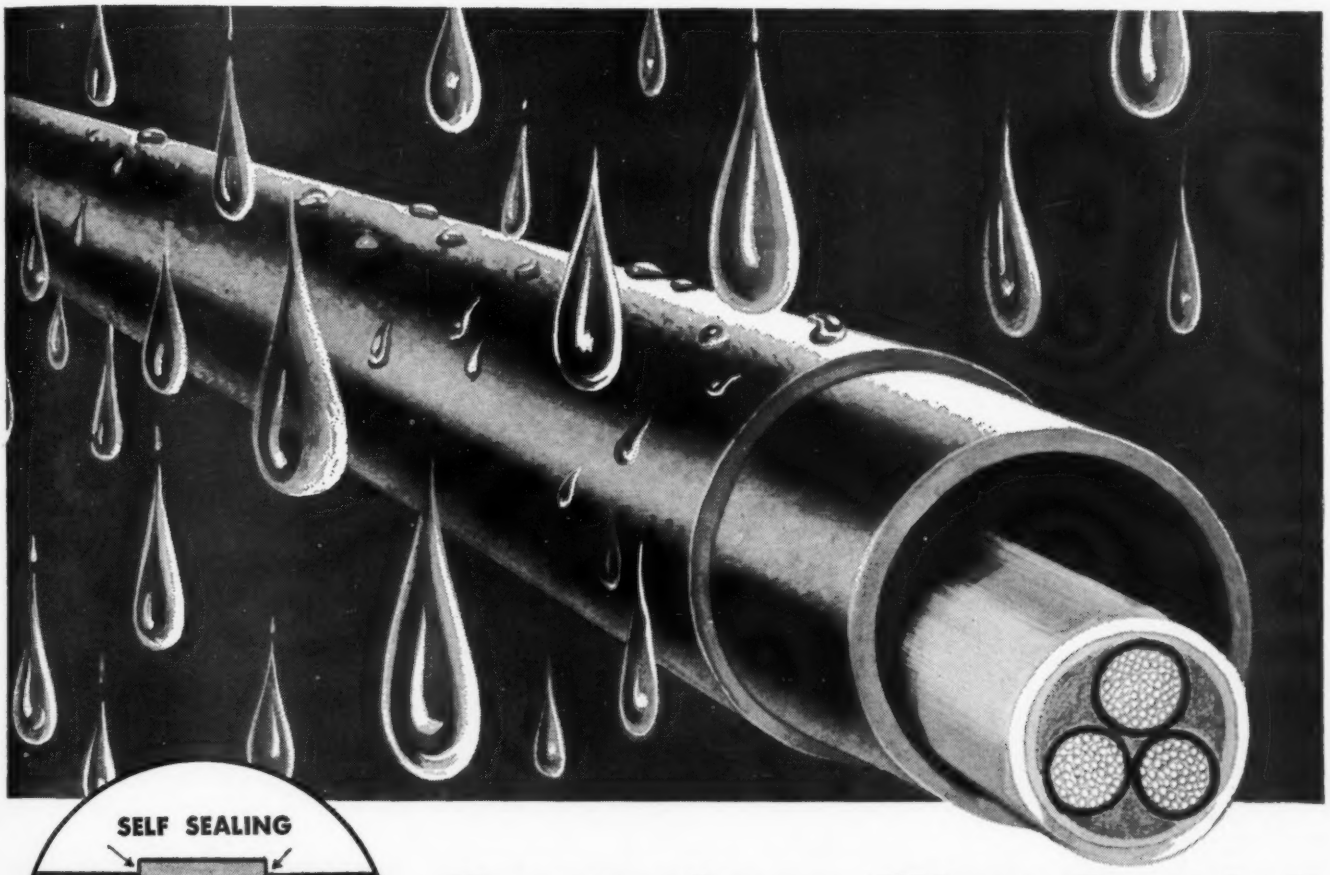
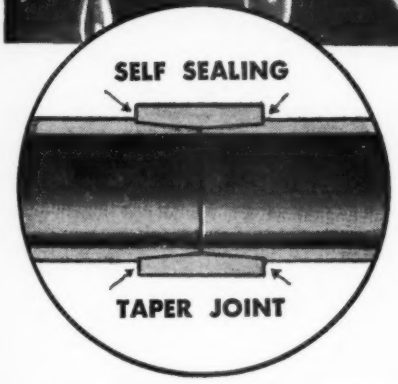
A MEMBER OF THE GENERAL TELEPHONE SYSTEM

ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

WATERTIGHT!





Orangeburg Fibre Conduit Prolongs Cable Life

Keep out corrosive ground waters, and you prolong the life of underground cables, say utility engineers!

Why? Because ground waters containing corrosive elements derived from the soil and concrete encasement attack cable sheath and shorten cable life. Orangeburg's impermeable wall and self-sealing Taper-Sleeve Joint shed them *"like water off a duck's back."* You get maximum protection with Orangeburg.

Orangeburg protects cables in many other ways. Smooth bore, low co-efficient of friction reduce incidence of abrasion. Its material is strong, tough, resilient, durable.

No other conduit is easier to install

Light, 8-foot lengths and a complete line of bends and fittings speed installation. Taper-Sleeve Joints tap water-tight in a jiffy. Orangeburg lays faster and at lower cost than any other type of conduit.

Orangeburg Fibre Conduit has prolonged cable life at minimum expense for utilities, municipalities and industry since 1893.

Distributed by Graybar Electric Company and by General Electric Supply Company. Branches and stocks in principal cities.

WRITE DEPT. T-57 FOR CAT. 52

ORANGEBURG MANUFACTURING CO., INC., Orangeburg, N. Y. **West Coast Plant, Newark, Calif.**

ORANGEBURG®
FIBRE CONDUIT

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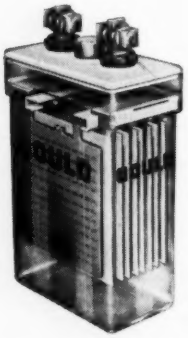
Pheasant hunting in Tacoma, Washington, where many champion field dogs are raised.

Set Your Sights on Longer Battery Life:

America's Finest!
GOULD PLANTÉ
The Aristocrat of
Stationary Batteries



Here's a tip that may help you.

You can reduce battery costs, save your company money and be better able to judge the comparative value of each make of battery, if you simply keep good battery maintenance records. You will extend battery life by consulting these records frequently, thereby assuring the best possible operating procedures.

Why not talk this idea over with your local Gould representative . . . he will give you easy-to-use maintenance record charts. Gould-National Batteries, Inc., Trenton 7, N. J.

Always Use Gould-National Automobile & Truck Batteries

More Power to you from **gould BATTERIES**

©1957 Gould-National Batteries, Inc.

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Fair value and original cost rate base states listed in reply to inquiry from security analyst. Gas pipe line company faces bankruptcy as result of FPC examiner's rate decision. Highway relocation reimbursement bill blocked by Maine Supreme Court.

THE RECENT action of the Minnesota Legislature in passing a new law putting that state in the list of so-called "fair value" states for telephone rate-making purposes (reported in this department last week) prompted an inquiry from a New York security analyst who reads this department regularly. Because it was an inquiry in which other readers may also be interested, here is the question and the text of the reply by your correspondent. It has to do with the relative standing of state commissions using an original cost rate base as compared with those which follow this loosely called "fair value" theory. The security analyst asks:

"Can you tell me the number and names of the state commissions which now use a strictly original cost rate base (or its close variants such as prudent investments or net investments) as compared with those which are supposed to give some recognition to present fair value in the form of reproduction cost, current replacement, or any other reflection of the present high cost of utility property?

"Also, if it were possible, I would appreciate very much having a comparison of this list as of the present time, with the comparative situation that prevailed around 1944, or shortly after the end of World War II. I believe 1944 was the date of the Hope Natural Gas decision and the present inflationary trend did not get under way until after the war and the removal of general price controls.

"My own interest in this, as you know, is for long-range security analysis and the outlook for public utility earnings. So, if there is any definite postwar trend to recognition of present fair value that would be a significant factor for financial judgment."

Here is this writer's answer to the financial expert:

"With the shift of Minnesota into the fair value column and confining our classification to telephone company rate-making only (there is a slight variation as between other utilities because of differences in the regulatory jurisdiction in such states as Minnesota, Nebraska, South Dakota, Texas, and the dual standard in New York), we have the following states listed in the so-called original cost column. (This includes what you correctly classify as close variants; namely, prudent investments and net investments: Alabama, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Idaho, Kansas, Louisiana, Massachusetts, Michigan, Missouri, New Jersey, New Mexico, North Dakota, Oklahoma, Oregon, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. *This makes a total of 27 states.*

"Now, we consider the fair value states, of which only two, Ohio and Mississippi, absolutely require consideration of reproduction cost as a controlling standard. But the others require some recognition of present fair value, whether it is called reproduction cost or replacement cost, or, to use the phrase in the latest law passed—the Minnesota statute—current values: Arizona, Delaware, Illinois, Indiana, Kentucky, Maine, Maryland, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, and Tennessee. *That totals 18.* And it might be noted, in addition, that there have been fair value rate base cost decisions in both Iowa and Texas. But, because of the absence of telephone rate jurisdiction, those states have not been included.

"It should also be added that the foregoing classification has been a matter of personal judgment, based not only on the language of state laws but also on court and commission decisions interpreting those laws. Such personal construction is necessary, in dealing with a classification of this kind, because commissions may put their interpretation on what 'fair value' means. And, since it is the result which counts, rather than merely words in the law, this writer has tried to classify results rather than words.

"To put it another way, the state law may say fair value, very clearly, and then state commissions may construe those words to authorize the use of an investment rate base. Comparisons of the laws and decisions in New Jersey and Virginia reveal examples of this.

"But, again, for practical purposes, it is the *results*, in dollars and cents, which count more than a statutory phrase which is not given the same construction in one state that it might be given in other states.

"Now as to the comparison of the situation which prevailed at the end of World War II, and just prior to the inflationary trend which really started to go full speed just before the Korean episode, here is the approximate line-up for 1946. *The original cost states numbered 30! The fair value states at that time numbered only eight!*

"Here are the 30 states where the state commissions were using the original cost rate base approach in 1946: Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Georgia, Idaho, Illinois, Louisiana, Maine, Massachusetts, Michigan, Missouri, Nevada, New Jersey, New Mexico, New York, North Dakota, Oklahoma, Oregon, Rhode Island, Tennessee, Utah,

Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming.

"And here are the eight states where state commissions were using the fair value rate base approach in 1946: Indiana, Kansas, Kentucky, Maryland, Montana, North Carolina, Pennsylvania, and South Carolina.

"By comparing the 1957 list with our 1946 list, you can see that quite a few important states have swung over into the fair value column. Generally, this was accomplished by decisions of the highest state courts. The states which made such switches include Arizona, Illinois, Maine, Minnesota, New York, and Tennessee.

"In addition, there were new regulatory statutes, setting up rate-making jurisdiction which did not exist before, as in Mississippi and Delaware. You will note also that not all the switching was towards the fair value column. Kansas, formerly listed by this writer (and also by the Federal Power Commission's analysis of 1948) as a fair value state, has now swung into the original cost column. Another state which apparently swung the other way was South Carolina.

"But on the whole, it is obvious that the trend, if it can be called a trend, is towards fair value. And, we do not have to look far to find the reason why. It is the impact of inflation. That fact has been expressly stated in some of the more recent decisions requiring recognition of present values for rate-making purposes."

It might also be said that switches of this kind are generally followed by counter-trends (which may or may not prevail) as in Maine and New York. In both of those states, court decisions requiring the use of fair value were followed by strong political efforts (led by the two governors), to get new legislation that would return utility rate-making to an original cost basis. This agitation is based on the theory that it would keep telephone rates from being increased. So far, Governor Harriman has not been successful in New York. But, at this writing the proposed Maine bill had passed one branch of the legislature.

Borrowers in Three States Get REA Telephone Loans

The Rural Electrification Administration approved four telephone loans the week of May 5, the U. S. Department of Agriculture announced on May 14. The loans totaled $1,781,000 and were made to borrowers in Indiana, Missouri and Texas. These funds will benefit approximately 3,800 rural subscribers. More than half of these families will receive telephone service for the first time. Details of the loans follow:

South Plains Telephone Cooperative, Lubbock, Tex.; $190,000, fourth loan (May 6).

The borrower plans to use the funds to expand its operating territory to provide dial service to 150 new rural subscribers and seven existing subscribers. The existing subscribers now receive common battery service over 4 miles of rural telephone line which the borrower proposes to acquire from the General Telephone Co.

The cooperative's present plans include a new automatic central office at Fieldton. The acquired line will be rebuilt.

Funds are included in the loan to complete the system set up under prior loans, and to construct a new headquarters building in Lubbock.

The four REA loans to South Plains total $1,666,000 which will make possible new and improved service to 2,206 subscribers. The Acuff, Caprock, Cone, Cotton Center, County Line, Edmonson, Halfway, Happy Union, Hollandville, McAdoo, Merrell and Woodrow exchanges are in operation, providing dial service to approximately 1,700 subscribers. Fieldton will be the 13th exchange.

George F. Sooter is president and Charles M. Means is manager of the South Plains cooperative.

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Modern Telephone Co., Norwood, Mo., $830,000, first loan (May 8).

The borrower plans to use this loan to construct a telephone system to furnish dial service to 1,640 rural subscribers. This includes service for the first time for 985 farm families. At present the Modern company is providing magneto service to 40 rural subscribers in and around Norwood.

As a center for the expanded service, the company plans to acquire with its own funds the following telephone properties: The Gainesville exchange now operated by Western Light & Telephone Co.; the Everton Telephone Co.; the Ozark Telephone Co. at Dadeville. These facilities now furnish magneto service to 615 rural subscribers, including 46 switchers. In addition, the Modern company plans to acquire 30 miles of toll line extending from Gainesville to West Plains now owned and operated by Southwestern Bell Telephone Co.

The company expects to divide its operating area into four exchanges, and build automatic offices at Dadeville, Everton, Gainesville and Norwood. Additional facilities include 480 miles of line. Commercial office facilities will be housed in rented quarters in Norwood. The acquired buildings at Dadeville, Everton and Gainesville will be used for branch commercial offices.

J. C. Joyce is president and manager of the Modern Telephone Co.

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Gill Township Telephone Co., Inc., Merom, Ind.; $81,000, first loan (May 9).

The company plans to use these funds to improve service for its present 171 subscribers, and to furnish initial service for 171 families.

The Gill company will purchase a building mid-way between Merom and New Lebanon, and remodel it to house new automatic central office facilities.

Wayne F. Johnson is president and manager of the Gill Township Telephone Co.

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Wilson County Telephone Co., Inc., Floresville, Tex. (mailing address: c/o Central Telephone Co., Decatur, Tex.); $680,000, first loan (May 9).

The borrower plans to use these funds to convert its system, now providing common battery service to 1,016 subscribers, to automatic operation and to furnish initial service to 634 rural families.

The company expects to construct a new unattended automatic central office in Poth, expand the Floresville building to accommodate new attended automatic facilities and a toll board.

A portion of the loan will be used to refinance the borrower's outstanding indebtedness. Headquarters of the system will be at Decatur, Tex., where Earl W. Nunneley, president and manager of the Wilson County system lives.

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Bankruptcy Regulation?

One of the strongest statements ever made by a public utility company dissatisfied with the regulatory treatment given to its application for a rate increase was registered last week in Washington, D. C., by the Colorado Interstate Gas Co. This pipeline company had applied to the Federal Power Commission (FPC), beginning in 1952, for two rate increases totaling 20 million dollars a year. The FPC suspended the increases, but came to no decision within five months. And, under the Natural Gas Act, Colorado Interstate was permitted to put the proposed rate increases into effect under bond. It has been collecting the higher rate since January, 1954.

And now an FPC examiner has gotten around to handing down a decision on the original application. It was quite a blow to the company. Using an original cost rate base approach, FPC Examiner Samuel Binder found that the company was entitled to only a 4.5 million dollar increase. This means that it will have to *refund* something like 50 million dollars. The examiner's decision has been appealed to the full FPC. But, the company says it is faced with bankruptcy, unless the examiner's ruling is changed radically.

W. E. Mueller, president of the company, said: "I am certain that the power commission will not allow this decision to stand as announced on May 8. It must be reversed and I am confident the commission will do this and set rates with which we can live. . . . If this decision is allowed to stand, there is no question in my mind but that the company will be bankrupted and placed in receivership. I feel certain that the commission will order a revision of his decision, but I also think it necessary to point out now what our situation will be if such a revision isn't forthcoming."

Applying the rates authorized by Examiner Binder to the pipeline company's 1956 operation, Mueller said Colorado Interstate would not have earned any dividend on its common stock and also would have failed to earn any preferred dividend and also would have failed to earn a substantial portion of the interest on its bonded debt. Mueller stated:

"Binder's rates would have given us a net operating income for 1956 of $1,168,192. Our interest requirements for debt for that year were $1,988,747. Under his figures, we would show a loss of 49 cents per share of common stock for the year.

"The same is true of the first three months of 1957. The examiner's rates, applied to our gas sales volumes, would give us a net operating income of $440,752 for that period. For the same three months our interest requirements are $580,906."

Mueller said he intended to go to New York City in an attempt to arrange some short-term financing to tide the company over until the commission can review the examiner's decision. "I cannot overemphasize the gravity of the situation facing Colorado Interstate as a result of the hearing examiner's decision," Mueller said. "I intend to see that this is pointed out to the commission in the strongest possible terms. Nothing less than a radical revision of the examiner's entire decision is necessary if we are to maintain gas service."

Mueller added that his company's plans for expansion of facilities for this year will have to be held up unless short-term financing can be arranged. "If this financing cannot be accomplished, our expansion program for the Rocky Mountain area will immediately shut down," he remarked.

Relocation Blocked in Maine

A Maine Supreme Court decision has thrown a new blockade in the path of public utilities seeking to obtain some compensation for the expense of relocation of facilities due to construction of federal-aid highway. It is probable that the basis of the Maine court decision, which holds that the state legislature could not constitutionally allow such compensation to be given to public utilities, is based on a peculiarity of state law which does not exist in very many states, possibly not in any other state except Maine.

But telephone companies and public utilities will want to check their state constitutions in this respect, to be sure that the Maine decision is not an unsuspected stumbling block of an entirely new form. The argument in Maine revolved around a constitutional provision preventing the diversion of so-called highway funds to any other purpose except highway construction and maintenance.

As readers of this department are aware, there are now on the statute books almost a dozen new laws permitting state highway authorities to use federal-aid funds for purposes of compensating, in whole or in part, public utilities for such relocation expenses. (At the last count, these included Florida, Georgia (publicly-owned utilities only), Idaho, Massachusetts (1956), Minnesota, Montana, New Mexico, North Dakota, Oklahoma, Tennessee, and Utah.)

In Maine, such legislation had passed one house and was being considered by the state senate when the question arose as to whether the bill would violate Maine's so-called "anti-diversion" provision of the state constitution, adopted in 1944. So, the state senate asked the Maine Supreme Court for an advisory opinion. And, the court decided that the relocation law, if passed, would be invalid, because the Maine Constitution provides that all revenues derived from fees, excises, and license taxes relating to registration, operation, and use of vehicles on public highways, and to fuels used for the propulsion of such vehicles must be expended solely for highway purposes.

In its opinion the court said, in part:

". . . in our opinion, the relocation of a utility facility is not to be construed as construction or reconstruction of a highway within the meaning of Art. IX, Sec. 19 of the constitution.

"We do not commonly consider that a power company, in erecting a pole line or a water district in laying a pipe in a highway, is constructing a highway.

"To an even lesser degree would we consider the construction of a pole line or a water pipe across country to be the construction or reconstruction of a highway, although the reason for the relocation was occasioned solely by changes in the highway.

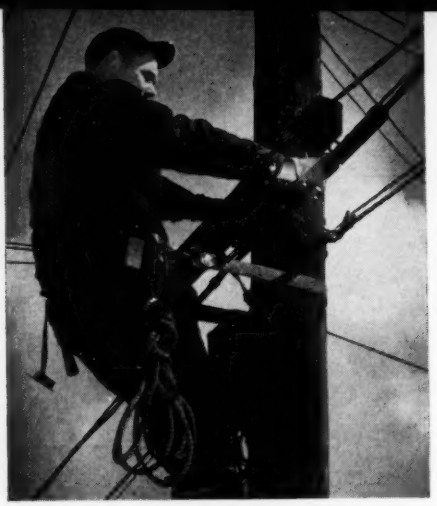
"The language of the constitution should not, in our view, be extended beyond its plain and ordinary meaning.

"The expenditure of revenues from sources enumerated in Art. IX, Sec. 19, supra, for these purposes would, therefore, violate the constitution.

"It will be noted, however, that there is no constitutional prohibition against the expenditure for such purposes of funds derived from other sources."

It may be that some other states do have "anti-diversion" provisions in their constitutions. It would have to be in the constitution to make any difference. If it were merely an anti-diversion provision in statutory law, the new relocation law would simply have the effect of correcting and amending it.

On the merits of the decision, some argument might be made with respect to the view taken by the court that the relocation of a utility's facilities, which otherwise would be an obstacle to the construction of a new highway, is not part of the construction job. It has been contended that relocation of obstructions and other necessary changes of that type is just as much a part of a highway construction job as grading, filling, draining, and other incidents of the road work.



THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

ALTHOUGH practically all hotels have telephones in every room, this is not true at the present time of motels since many of even the best ones are served by only a few paystations. This is not good, for the average motorist has just as urgent a need for a telephone if he stops at a motel as he does in a hotel.

The motel of today does not spare expense in the provision of everything considered necessary to make the traveler comfortable. Wall-to-wall carpets, tile baths, air conditioning and television, are common in our modern motels.

It would appear that the reason why more of them do not have telephones is due to the fact that telephone companies have not done a very good selling job. Certainly, modern motels are good new telephone business prospects which should not be neglected.

It is claimed that the motel industry is one of the fastest moving in this country today. There are now 56,000 motels in operation in the United States, and 3,000 new ones are being built every year. They accommodate about a million people every night. A million travelers can mean a lot of telephone business—if proper facilities are provided.

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We have been informed by C. W. Evans, of Hutchinson, Kan., supervising repair foreman for the Southwestern Bell Telephone Co., that he is presently experimenting with a transistorized amplifier to be used with a tone-type cable test set.

This amplifier makes use of three transistors and has a gain of 85 db and a maximum output to receiver of one milliwatt. The frequency response is flat above 600 cycles. This response can be flat down to 20 cycles if desired by increasing the capacity of the coupling condenser from .5 to 5 mf.

Mr. Evans admits that he is not certain that flat frequency response is desirable as the Bell System's three-tube amplifier is strongly peaked near 500 cycles.

The gain of the transistorized model is equal to the three-tube amplifier. It is powered by two penlight dry cells and has a current drain of 2.8 milliamperes.

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It is noted that our old friend, Foster L. Stanley, has retired from the Indiana Bell with 37 years service.

We were associated with Foster during the late war when he was a colonel in the Signal Corps.

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We have received a clipping from the Miami (Fla.) *Daily News*, sent us by W. S. Kemper, of that city, describing how an underground telephone cable was made speechless by mistake.

Workmen digging a hole to erect a highway sign accidentally cut the cable and placed 900 telephones out of service. The news wires that bring race results from Gulfstream Park were also interrupted.

It is indeed shocking to hear of the number of underground telephone cables that are damaged every day because of careless excavations. Most cable routes are well marked and in many cases telephone numbers are indicated that should be called collect if there is any suspicion that digging operations may damage cable.

Despite all this, the costly damage and interruption of service continues. Perhaps a well-planned publicity program indicating the damage that may be caused to vital communication might cause the public to think before they dig and make important cables speechless.

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The Blain family maintained a bird feeding station in our Virginia back yard last winter. It must have been a success for the birds consumed 175 pounds of feed in addition to all of our stale bread and table scraps.

An engineering problem of considerable complexity was involved in perfecting a feeder for the birds that was timber squirrel-proof. This was eventually accomplished much to the displeasure of our squirrels, and they have never quit trying to reach the bird feeder. In order to appease them, we bought raw peanuts in 10-pound sacks and fed them a daily ration.

Our bird family was large and noisy at all times. Starlings and the several varieties of sparrows predominated, but we were glad to feed them so that we could attract the more desirable birds.

Two pairs of pigeons, with ravenous appetites, also paid us several visits each day. We had four pairs of beautiful cardinals that spent the winter with us.

Several white-breasted nuthatches, beautiful birds, were seen several times, and a number of blue jays paid us periodic visits. The latter ate a little, chased the other birds, and stole peanuts from the squirrels.

Two pairs of mourning doves spent considerable time in and near the feeder and became quite tame. One lone yellow-shafted flicker, paid us one visit, but never returned. Catbirds and mocking birds were numerous at times, but then for some reason moved on after short visits.

We also had a lone woodpecker who was found feeding often early in the morning. After he had his breakfast, he usually made a terrific clatter on a downspout before leaving. We could never determine whether he wanted to wake us or use this means of thanking us for his meal.

Robins appeared in large numbers early in the spring and apparently liked our fare.

At any rate, we derived a lot of pleasure watching these feathered friends from our kitchen window. Next

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winter, we hope to have even more bird visitors.

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We often wonder if the word prefix to telephone numbers as we know it today will survive much longer, because it has outlived its usefulness.

Many business concerns have dropped the word prefix in their advertising and merely use AD for Adams, EM for Emerson, etc. If this is satisfactory—and it is evident that it is proving to be—then why not drop the AD and use 23 and 36 for EM. It is obvious that the word prefix is a carryover from the old manual days and it serves no useful purpose to people who dial their numbers.

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Now we note that an advertising novelty firm has brought out a miniature telephone ball point pen desk set equipped with a music box. We do not know just what useful purpose the music box serves, but we must admit that this is a most interesting novelty.

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Teletrends, house organ for the Whitney Blake Co., recently published a picture of a hooked splice made by a subscriber of the United Telephone Co. of the Carolinas, Inc., on a rural line. This splice, strange as it may seem, gave service until it was noticed by a line crew and removed.

Splices of this type were no novelty in the old days. They worked, after a fashion, but no doubt they were the cause of much noise and cut-out trouble. They were called various names, such as hook splice, bailing wire splice, etc.

Subscribers had a deadly fear of lightning in the old days and did not trust lightning protectors for they did not protect in every case. It was common practice to have a hook or a common harness snap in the open wire drop to the house and disconnect the line during a storm.

In addition to being noisy, this arrangement usually grounded the entire line during the time the drop was disconnected. Then, too, many forgot to reconnect the drop promptly after the storm had passed.

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According to *Medical Notebook*, psychiatrists hint that there is a new form of neurosis making the rounds: A feeling of guilt on the part of TV fans who don't use the products advertised by sponsors of their favorite programs.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. Do you have any data on how Type "C" Neoprene Drop wire can be successfully spliced so that the splice will withstand resistance to water equal to the original jacket? We are successfully using this type of wire submerged in salt water but have several proposed runs in excess of the normal 1000-foot coil lengths. We have not been able to purchase greater lengths. We believe that it might be possible to make use of a vulcanizing kit for splicing type "C" drop wire similar to that used by the Signal Corps during the late war to splice Spiral-Four cable.

A. We have referred your problem to the engineers of a wire manufacturer and are informed that they would not recommend a field splice in this type of wire for use under water or underground. This company states further that they can supply lengths without splicing up to 10,000 feet. These longer lengths are furnished on a wooden reel at only a nominal increase in cost.

While you have met with success in the use of Type "C" Neoprene insulated drop wire in salt water, you might not have been quite so successful had it been installed in fresh water. This same manufacturer recommends a wire for this purpose that is insulated with rubber of the type generally used in the manufacture of submarine cable. This type wire has been used to serve a number of installations from shore to island subscribers in lakes. One installation also serves a bridge tender's station where a considerable length was placed in salt water.

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Q. What are the advantages that can be expected when use is made of self-supporting exchange cable?

A. Because of the high strength of Copperweld conductors; this type of cable does not require a supporting messenger. This feature reduces the cost of material and time required to install aerial cable. This type of cable also proves ideal for use in locations such as apartment houses where several drop wires are run from a terminal to a common point on the building.

Q. We have heard rumors recently that a very small, inexpensive, lightweight teleprinter is now available on the market. Can you tell us how much this machine weighs and its approximate cost?

A. We have advice that a 12-pound teleprinter, known as the "Mite," has been developed and is now under test, though not yet on the market. This unit measures 5 inches x 11 inches x 11 inches, and is said to operate at any standard speed up to 100 words per minute.

We are advised that the cost of this machine cannot be determined until after production plans have been completed.

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Q. We are planning the installation of a considerable quantity of small plastic cable for telephone distribution in a new housing development. We have determined that the cost of hand digging will prove prohibitive. Is there any type of power trencher which can be used to advantage on a job of this type?

A. A small gas engine mechanical trencher recently placed on the market should prove ideal for this purpose. This machine digs a trench 3 inches wide and from 1 inch to 24 inches deep at a speed of about 10 feet per minute in average soil conditions.

It is claimed that the digger teeth will chew through tree roots up to 2 inches in diameter. Large stones must be removed from the trench, but stones smaller than 3 inches or 4 inches are thrown out by the digger teeth.

The digger will automatically maintain the depth of the trench at that for which it is set.

The machine is easily loaded on a pickup truck or unloaded and operated by one man. It weighs only about 200 pounds.

It is powered by a well-known standard four-cycle gas engine. The operator walks behind and controls the digger in a manner similar to a power lawn mower.

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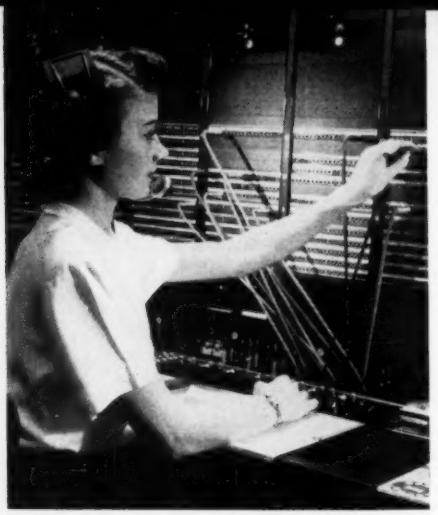

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

IT HAS OFTEN BEEN STATED, "Humans are creatures of habit." If we review our daily actions, we find this is true. We follow a certain pattern, regardless of our station in life. Housewives usually have a certain day to wash and iron, clean the house, do the marketing, baking, etc.

Business women also have a certain procedure each day. They arise at a certain time, have breakfast and, if they have an apartment, they usually wash the breakfast dishes, make the bed and tidy up their quarters. After a refreshing bath, putting on their makeup, combing their hair and dressing, they are off for business.

Humans follow a certain pattern on the job, too. Occasionally, they pick up a few bad habits, such as staying out beyond the specified coffee break; being a few minutes late for work after lunch time.

Telephone operators occasionally develop some bad operating habits and, if they are not nipped in the bud, they may become difficult to overcome, which reminds me of the tutor, the student, and the four plants. A wise old tutor was once taking a stroll through a forest with a youth by his side who had developed some careless habits.

The tutor suddenly stopped and pointed to four plants close at hand. The first was a tiny sprout, just coming up out of the earth. The second had rooted itself quite firmly in the fertile soil. The third was a small shrub. The fourth had grown into a well-developed tree.

The tutor said to his youthful companion, "Pull up the first plant."

The youth pulled it up easily with his fingers.

"Now pull up the second."

The youth obeyed, and with slight effort the plant came up, roots and all.

"And now the third."

The boy pulled with one hand, then the other, but it would not come. Then he took both hands, and the plant yielded to all his strength.

"And now," said the master, "try the fourth."

The youth grasped the trunk with all his might, but hardly a leaf shook. "I cannot move it," he exclaimed.

"Just so, my son," said the tutor, "with our bad habits. When they are young and small, we can cast them out, but when they are full grown, they cannot be uprooted."

An alert supervisor, or service assistant, will keep all bad operating habits in the "tiny sprout" category so that they may be easily uprooted before they become deeply lodged and difficult to overcome.

In weeding out bad operating habits, a supervisor should feel her way to encourage favorable reaction on the part of the operator. There is nothing to gain by rushing into action. Do not be as interested in a mistake that occurs rarely, as in a fault that is repeated. Be alert to operator's reactions to requests, suggestions, and discussions.

Above all, a supervisor should apply the Golden Rule in all of her contacts with her operators. She should be understanding and patient. Take advantage of the occasions when she can conscientiously commend an operator. She should give encouragement and help whenever possible.

A supervisor will make fewer mistakes if she will go slowly, being sure to get all the facts, weigh what is wrong, decide what to do, and then, take action.

A most important factor to bear in mind is, just as every leaf in the forest and every grain of sand is different, so it is with human beings. The better a supervisor knows each one of her girls, the easier it will be for her to help them to become better operators and more satisfied employes.

If your operators feel that you know them and understand them as individuals, know that you are trying to help them to enjoy their work and make it easier for them, you'll find them welcoming your help.

It is important for a supervisor to find ways to keep her operators interested and make them feel happy in their jobs. Interest should be developed in office results so that everyone will work for the success of the office as a whole.

In rooting up bad operating habits, be they large or small, "feel your way." Remember the old saying, "Fools rush in where angels fear to tread."

Traffic Questions

(1) How should the outward operator proceed when a BY is encountered on an Aircraft Flash call?

(2) When an outward operator reaches the called telephone on an Aircraft Flash call, how long should she monitor on the connection?

(3) On an Aircraft Flash call, if switchhook supervision is not received from either telephone, how frequently should the outward operator monitor the connection?

(4) When calling a Filter Center, how does the observation post observer place his call?

(5) With whom does the observation post observer place his call?

Answers are presented on page 52.

Award Names Keith McHugh Man of the Year in N. Y.

Keith S. McHugh, president of the New York Telephone Co. and of the Community Services Society of New York, has been named "Man of the Year" by the Hundred Year Association of New York, it was announced on May 13 by J. Wilson Newman, president.

He will receive the 1957 Gold Medal Award at the association's annual dinner on Sept. 24. The award is presented each year to a citizen who in the association's view has made an outstanding contribution to the betterment of the city and the welfare of its people.

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today's Highlights

of finance-taxes-business trends

by Willard F. Stanley

INTEREST RATES POINT UPWARD AGAIN—After holding the line for several months, long-term interest rates have again pointed upwards. Recent decision of the U. S. Treasury to raise 1.5 billion dollars of new money by short, rather than long-term financing recognized the cluttered condition of the market for new funded debt. The approximate 4.70 per cent yield for the recent offering of El Paso Electric "A" rated bonds confirms this trend.

After dropping off in April, utility bond offerings are scheduled at substantially higher levels for May and June—approximating the amounts raised in February and March of 1957. May industrial offerings are scheduled substantially below previous months. Coupled with some recent statistics, indicating a decline in amounts of new contracts for industrial construction, this may presage lower future demands for funds from this source, or it may simply reflect a coincidental exception to the rule of high industrial demands for funded debt funds which has existed for many months past.

The Wall Street Journal tabulation of 15 new utility bond issues at May 16 shows average yields, based on bid prices, 1½ decimals (0.015 per cent per annum) above the yields based on the offering prices of these securities. So, tighter long-term money hasn't yet been reflected in these comparisons.

While a few items indicate possible hope that bond market conditions may become more favorable to issuers in the not distant future, all signs seem to point to firm long-term money in more immediate periods.

Under these conditions, utility issuers needing funded debt funds within the next few months should proceed to raise these funds by normal procedures without either acceleration or delay. As to more remote needs, there is hope that more

Mr. Stanley, formerly financial vice president of Southwestern Public Service Co., an electric utility with over 160 million dollars in assets, is president of Corporate Services, Inc. of New York City. He is a member of Controllers Institute of America and New York Society of Security Analysts. He serves on three committees of the Controllers Institute having to do with federal taxation, social security and finance management. His articles are appearing once a month in TELEPHONY.

favorable rates may prevail. This is why acceleration seems inadvisable, considering the extremely high present plateau of long-term interest rates.

Utility common stocks remain generally at attractive price-earnings ratios and dividend yields for issuing new equity capital. There has been no dimming of the "green light" which has been shining so long for common equity issues. Only drastically higher earnings, or other special developments, anticipated for the future and calculated to increase the price of the common stock substantially, would seem to justify delay in raising equity capital requirements for as far ahead as a year or even more.

* * * *

SPRING UPSWING IN STOCKS—With the coming of Spring the stock market has continued to bloom with the most robust rally for many months. After dropping as low as 6 plus per cent below the Dec. 31, 1956 closing, the New York Times 50 combined stock average at May 17 had climbed to between 1 per cent and 2 per cent above the 1956 year-end average. Continuance of generally good business statistics; generally better than expected first quarter corporate earnings; and the general feeling that creeping inflation will be the order of the day for some time to come, have combined to bring about this result, together with lessening of international tensions in the Mid-East.

We still incline to our original view that swings either up or down should not exceed 10 per cent in the Times average from the 1956 closing figure. But the present recovery is welcome to investors, although it has been unusually selective and many stocks have failed to share in the prosperity. Utilities have no cause for complaint in recent weeks since most of them have registered gains commensurate with the general market appreciation and the relative stability of the industry.

* * * *

SPECIAL ADVANTAGES TO INVESTORS IN UTILITY STOCKS—Stocks of utilities, particularly electric utilities, have for some little while, offered investors desiring high after-tax income an unusual benefit. This is because dividends on a number of these stocks are free of income tax to a substantial extent. It has not been unusual for companies to pay non-taxable dividends in special cases, but customarily these situations were limited to a special loss occurring in a single year. The difference in the case of these electric utilities is that the non-taxability seems likely to recur for several years, five years or even more in some cases. Also, this non-taxability is often substantial, 40 per cent of dividends being not uncommon. The percentage of non-taxable dividends also varies considerably between companies from year to year in the same company, but in many cases the savings in taxes should be sufficient to substantially increase after-tax income for some time to come. This subject will be developed further in our next column.

XUM

TELEPHONY'S ELECTRONICS SECTION

BY HAROLD B. McKAY, ELECTRONICS EDITOR

PULSE GENERATOR

TELEPHONE systems were among the earliest devices to use pulsed electricity. These systems required comparatively long pulses with a slow repetition rate, and such pulses were readily generated by mechanical means such as relays and interrupters.

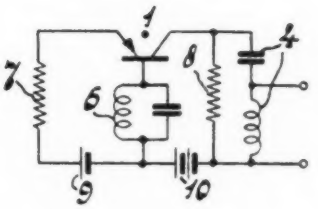
The advent of radar brought the development of techniques to produce pulses electronically. This made possible high repetition rates, and pulse lengths measured in millionths of a second.

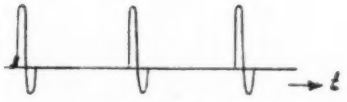
The development of such apparatus is still continuing because of the requirements of the computer business and the coming of electronic switching in the telephone business among other things. The versatile transistor is keeping up with this pace.

Evidence of this is seen in a recent patent for a pulse oscillator, which is of interest because it shows how pulses can be generated by electronic means. It is even more interesting because one transistor is made to set not only the pulse length, but also the spacing between the pulses.

In the drawing for Patent No. 2,784,315, the transistor is numbered 1. A circuit 6 has a resonant frequency which is much lower than the resonant frequency for circuit 4. In operation, the circuit 4 will start to cause oscillations because the transistor is connected as an oscillator.

However, only a single oscillation will be produced, because the low-frequency circuit will suppress the oscillations immediately. The net result will be a sharp signal of the





Patent No. 2,784,315

frequency of circuit 4, and a space until the next oscillation which is determined by the time duration of circuit 6. The lower drawing shows how this would look.

The patent was issued to P. F. Moleman and J. P. Beyersbergen of Eindhoven, Netherlands and assigned to Hartford National Bank & Trust Co.

Typical values of the circuit components as given in the patent are as follows: Circuit 4: 0.2 mh & 2200 mmf, circuit quality 5, resonant frequency 270 kc. Circuit 6: 3 mh & 15,000 mmf, circuit quality 100, resonant frequency 28 kc.

R7: 1000 ohms. R8: 1500 ohms. Battery 9:2 volts. Battery 10: 30 volts. Repetition frequency, 27.8 kc, pulse width 2.1×10^{-6} second.

TRANSISTOR CLOCK

NEW WAYS are being found to induce the transistor to snatch power out of the air. The latest is a patent held by General Electric for a battery-powered electric clock which contains a transistor amplifier.

A pickup coil in the clock responds to 60 cycle fields which are around everywhere that power is used. This 60 cycle power is amplified until it is strong enough to run a clock.

Thus an electric clock may be made which runs on its own batteries, has no cord to connect with the power line, but whose time remains synchronized with the power frequency anyway.

MICROWAVE EQUIPMENT

THE DEVELOPMENT of microwave equipment is proceeding at a fast pace, particularly in the field of scatter propagation. This is a method by which the range of a microwave system, formerly thought to be limited to line-of-sight distances, can be made to operate up to 200 miles.

The forward scatter technique may be visualized by thinking of a searchlight which is beamed at the sky. The "scatter" of light from particles in the air makes the searchlight beam visible at distances greater than if the searchlight were beamed level with the ground directly at the viewer.

Philco has just developed a microwave outfit for the Air Force which employs tropospheric scatter and operates at frequencies of from 7125 to 8500 megacycles. This development has resulted in the design of a four-cavity klystron rated at 2000 watts continuous power. Twenty-eight-foot parabolic antennas develop a 54 db gain and provide a band-width of 0.3 of a degree.

Demands for lower receiver noise levels have resulted in a greatly improved receiver, two of which are used for diversity reception. This system uses two receivers spaced 100 or more wave lengths apart. At this distance, fading is not likely to affect both receivers at once.

Older systems have used switching apparatus on diversity receivers to cut in the receiver on which reception would be best at any one time.

Philco has developed a "combiner" which puts the outputs of the receivers together without trouble from switching transients, it is claimed.

The scatter technique reduces maintenance problems by eliminating repeaters. From a military viewpoint the narrow beam reduces the chance of interception.

The wide band of transmission makes the system suitable for radar and television.

TELEVISION RELAY

A NEW portable microwave television relay has been announced by the Raytheon Mfg. Co.'s commercial equipment division. Designated the KTR-1000G it is said to be the latest word in color TV relay equipment.

A video response of plus or minus 0.1 db to 6 megacycles is claimed for the unit. Newly developed silicon crystal mixers are used to provide an improved receiver noise figure.

High gain-bandwidth WE404A tubes are used, and a special lightweight inter-connecting cable permits use of lengths up to 600 feet.

The equipment also features built in tunable wavemeters and remote mechanical tuning. Broadband wave guides permit operation from 5925 to 7425 megacycles by simple selection of the proper klystrons and antenna feeds.

TRANSMISSION TESTING

TELEVISION BROADCASTERS, and telephone companies which handle TV relays and studio-transmitter links usually have test equipment on hand which generates special pulses for testing the transmission over their facilities.

Many of these test units have been made by Polarad Electronics Corp. Now this company has developed a new instrument the Polarad MSG-34 which covers C and X band frequencies, 4,200 to 11,000 megacycles with a power output of 1 milliwatt.

Used as a signal generator the instrument can furnish internal pulse and square wave modulation, or may be modulated externally. Large, direct reading dials indicate frequency and attenuation.

The wide band coverage permits this unit to equal two or more test sets of conventional construction.

SUBSCRIBER LINE CARRIER

IF YOU PLAN to use subscriber line carrier in your plant some day, you'll be interested in a new book put out by Lynch Carrier Systems, Inc., 695 Bryant St., San Francisco 7, Cal. Entitled "B120 Equipment Characteristics," this 73-page book is more than the ordinary sales piece; it is a contribution to the literature of the business.

Part of the book covers the features of the B120, but this is done in a manner which permits a reader to analyze his own needs and determine the various types of components, signalling units and such, that he will require.

Each of the principal components are described and although the book is not a technical nor an installation manual, functions of different parts such as filters and impedance matching devices are explained clearly.

Most of the book is devoted to system engineering and data.

This includes many interesting application diagrams on how different kinds of party lines are put together on a carrier system. Also contained in this part are tables on decibel losses on lines and cable, the use of entrance cable, impedance matching, channel dropping and the use of filters and line coupling networks.

An appendix shows how to make an attenuation vs. frequency measurement of open wire lines. This results in the construction of a curve which will show up faulty line condition, such as mismatching, or other discontinuities, such as the effect of a forgotten length of drop wire left as a repair in the open wire lead.

You can get this book on your request to the Lynch company.

ANTENNA COMPUTER

IF YOU ARE ON THE VERGE of installing microwave you will want one of the new Andrew Parabolic Antenna System Computers. This is a slide rule type of card which enables a communication engineer to calculate parabolic antenna radiation characteristics, passive repeater performance, free space and scatter attenuation and thermal and equivalent noise input of receivers.

The reverse side of the computer is a transmission line and wave guide computer. Attenuation, power ratings and mechanical details are shown.

You can get this on request from the Andrew Corp., 363 East 75th St., Chicago 19, Ill.

KLYSTRON FACTS

KLYSTRON FACTS Case #4 is the title of a 24-page brochure just published by the Eitel McCullough

XUM

Co., of San Bruno, Cal. It summarizes recent Eimac developments in the field of klystron design and includes useful facts on power klystrons, beam switch tubes and others.

A Quick Reference Catalog is also published by this company which gives summarized data in handy form for their line of tubes.

The brochure and catalog will be sent upon request. Write to Eitel-McCullough at the address given above.

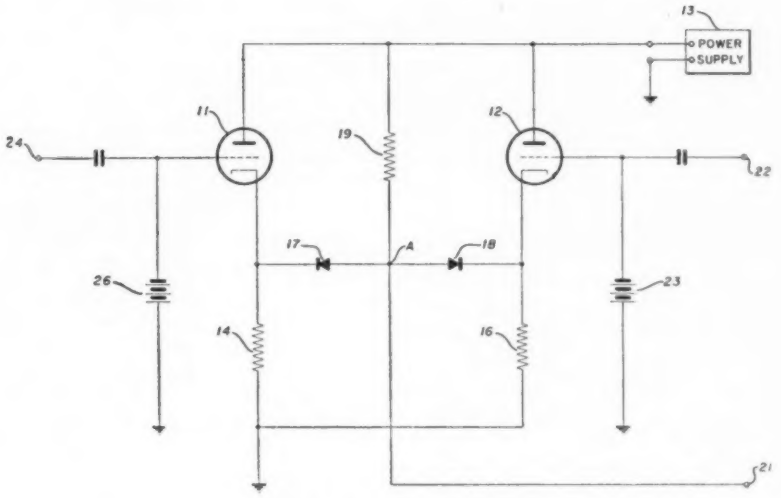
ELECTRONIC GATING

AMONG the circuits we may expect to have with us when electronic switching arrives on a large scale in the telephone business is the electronic gate. A gating circuit is essentially a switch or relay which permits one circuit to control another. It does this by opening or closing a "gate" through which current can flow.

Some of these circuits may become quite involved, while some are simple. A recent development has resulted in a patent for a gate which has a limiting as well as a switching action, yet is quite simple in operation.

Patent No. 2,781,448 (see cut) uses two vacuum tubes 11 and 12 and two crystal diodes, 17 and 18 as its principal functioning parts. With no signal or voltage applied to the input terminals 22 and 24, the potential remains constant at point A and hence at output terminal 21. This is because the bias voltages 23 and 26 keep both tubes in the cut-off condition, and no current flows through them.

Current does flow from the power supply 13 through resistance 19, the two crystals 17 and 18, and the two cathode resistors 14 and 16 to ground. Most of the power supply voltage is dropped in resistor 19 so



Patent No. 2,781,448

that the potential at point A may be about 5 volts.

If a positive voltage is applied to terminal 24 which is large enough to overcome the negative bias battery 26, this pulse will cause tube 11 to conduct. This increases the voltage drop across the cathode resistor 14 to a point where the cathode of tube 11 is higher in voltage than point A. However, as long as the other tube remains non-conducting, the voltage at point A does not change because no current will flow backwards through crystal 17.

Similarly, a positive pulse at terminal 22 would cause tube 12 to conduct, but this would not change the voltage at point A if tube 11 was non-conducting.

If, however, two sources of positive voltage are connected at 22 and 24, both tubes would conduct and both cathodes would be raised to a voltage higher than point A by the drop across the cathode resistors. This would leave no low resistance path to ground for point A so the potential here would rise. This would also cause a rise at the output terminal 21.

In practical application, the input to terminal 24 might be regarded as a signal, and the input to 22 would be the gating pulse. In telephone language, the first would be the contacts, the second the winding of an electronic relay. However, this circuit would do more than a simple mechanical relay. The amount of gating is determined by the voltage of the gating pulse. Thus a varying voltage into tube 11 will vary the voltage at A and 21 only within the limits that tube 12 is conducting. This circuit therefore has a limiting as well as a gating action.

The patent was issued to W. C. Struven and assigned to the United States Atomic Energy Commission.

AUTOMATIC TOLL SWITCHING

LAST year the first installation of the new FW-1 intertoll switching system was placed in service in Canada. This system consists entirely of step-by-step equipment and features such things as four-wire switching, separation of transmission and signalling paths and many special circuits.

A description of part of this system was presented in June 1956

before the American Institute of Electrical Engineers in San Francisco by Imre Molnar, Ph.D. Now, a more complete description of the system is available in the current issue of the Automatic Electric Technical Journal.

Molnar's paper is reprinted in the magazine. It deals with the problems of switching and transmission. An explanation of the hybrid coil and its uses are given and the advantages of four-wire switching are developed. Basic schematic drawings are given to illustrate each point and a network switching idea dubbed the "Tail-Eating Scheme" is developed. The "via net loss" problem in switching is fully developed in this article and terminating loss conditions are also discussed.

Other articles in the magazine include an explanation of an automatic cordless toll switchboard and a description of the "camp on busy" feature. This is a system whereby if all circuits out of a switching point are busy, the originating operator receives a busy signal, but the selector camps on the circuit, waiting for an idle trunk to appear. When a circuit becomes available, the busy signal being sent to the operator changes to reorder, to notify the operator to try again. Of course, this could lead to complications because a great many operators might be camping on a trunk group. This would not only result in a grand scramble every time a circuit became available, but it would also tie up valuable trunk equipment in the camping condition.

So the engineers thought of this also, and a master busy or no-camping signal will be returned to the operator when there are too many waiting for the circuits.

If you would like to read more about all of this, write to Walter Axelsen, editor, Automatic Electric Technical Journal, 1033 West Van Buren St., Chicago 7, Ill., and ask him for a copy of his latest issue.

RURAL CARRIER

THE Bell System's new P-1 Carrier System for rural service has been undergoing experimentation and field trial for some time. The project has involved many new concepts and techniques. The system uses transistors and printed circuits, and the pole mounted terminal resembles a small bookcase into which the circuit cards are inserted like shelves.

The use of transistors resulted in a great reduction in the amount of power needed, for example, a P-1 terminal uses 1.2 watts when operating, compared to 40 watts for an N-1 inter-office trunk carrier terminal.

An additional advantage appeared during the course of development when it was found that the use of transistors also permitted the use of a single amplifier design for several different places in the system. The amplifier can be used in compressors, expandors, transmitting amplifiers and as part of the receiving amplifiers.

The design provides for Western Electric NPN grown junction type transistors coded 4B for the voice frequency and 4C for the carrier amplifiers. Feedback is obtained by using hybrid coils at the input and output of the circuit.

A discussion of the new system appears in the March 1957 issue of the *Bell System Technical Journal.*

THINGS TO READ

THE SHASTA Division of Beckman Instruments, Inc., announces the availability of a new four-page, two-color catalogue describing its line of electronic test instrumentation including expanded scale voltmeters and frequency meters, vacuum tube voltmeters, oscillators, resistance bridges, power supplies, wide band amplifiers, WWV receivers and decade inductor. Beckman Instruments, Inc., P. O. Box 296, Station A, Richmond, Cal.

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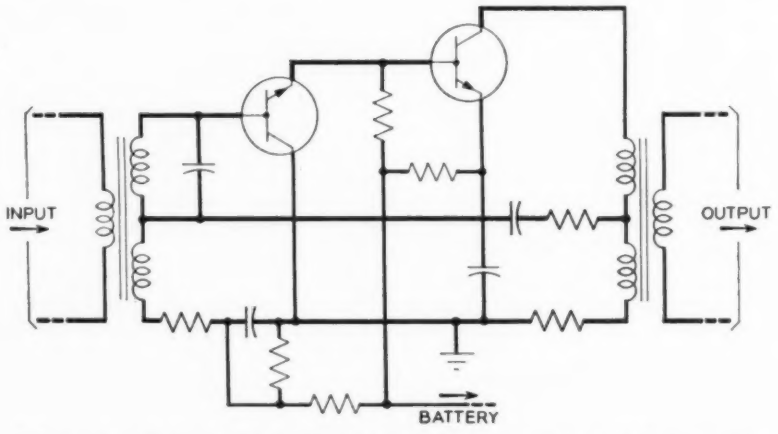
NEW ILLUSTRATIVE bulletin describing electronics testing equipment has been issued by Simpson Electric Co.

The six-page brochure, No. 2056, gives concise descriptions and specifications of products in the Simpson Electric line of testing instruments.

In addition to the Simpson Electric panel meters and other specialized testing equipment, several new products are listed in the booklet.



Schematic of the transistor amplifier which is used in different parts of the P-1 Rural Carrier System.

—Courtesy Bell System Technical Journal.

Also shown is the Capacohmeter, Model 383-A, an in-circuit capacitor leakage tester which can also measure capacitance of good capacitors as well as perform a variety of other tests.

Other testers listed, include ohmmeters, a vacuum tube volt-ohmmeter, and a volt-ohm microammeter.

Copies of Bulletin 2056 may be obtained by writing Simpson Electric Co., 5200 W. Kinzie St., Chicago 44, Ill.

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A NEW OFFICIAL REGISTRY of the radio stations serving transportation services has just been published. The book lists all of the stations used by taxis, railroads, buses, trucks and other land transportation services.

Part 1 of the volume lists the stations by service, state and company. This makes it possible to quickly find the call letters, frequency, number of units and type of equipment used by any company in any city in the United States.

In addition to those services operating on the regular mobile frequency, the registry also lists companies operating transportation radio systems using citizens band (465 mc.) frequencies.

Part 2, a new section added to the registry for the first time this year, lists the transportation service radio stations by operating frequency. Stations operating from 30 mc to 6830 mc are listed by call letters and location in this part of the book.

The registry contains 76 pages and is edited by Ethel V. Sleeper. It is one of several registries published by Communication Engineering Book Co., of Radio Hill, Monterey, Mass. The price is $4.00.

The registry covering industrial services was described in the March 30 issue of TELEPHONY.

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CONTACT-MAKING meters are widely used in telephone applications, but there are many things that can be done with them that you may not know about.

A catalog which contains several circuit diagrams can be obtained by writing to Assembly Products, Inc., Chesterland 1, Ohio. Ask for Catalog 4C.

HOW TO GET LICENSED

Technicians

for 2 way radio

...microwave

ALL TYPES OF ELECTRONIC EQUIPMENT

The basic requirement of an electronic technician is a thorough understanding of the fundamentals. The electronic devices being used by telephone companies demand technicians who "think electronics"!

This publication *Telephony* recently inaugurated a section devoted to electronics. This is graphic proof of the impact made by electronics on the telephone industry.

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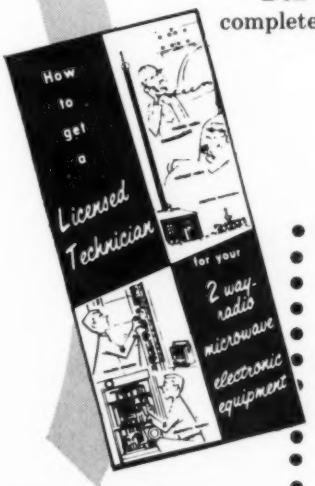

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A New Water Rheostat for Testing Exchange Power Plants

By STANLEY M. LLOYD*

TOASTERS, room heaters, trolley rheostats, and even pickle barrels of brine with iron electrodes "position controlled" by ropes, were the early forerunners of Installation Engineering's recently developed rheostat for testing telephone exchange power plants.

The contrivances were enough in the old days when the sufficiency of an artificial load was the prime concern, but now power plants are large, complex and, in many types, automatic. Testing procedures have to keep pace with improved equipment, so the problem becomes one of more than merely absorbing, or dissipating, full energy output—fractional and overload currents, and the verification of automatic controls must now be considered. The load imposed must also be variable to the voltage and full output current of the equipment. The tool for testing modern power plants for telephony becomes a highly specialized item, not commercially available.

To meet this need it was necessary for engineers of the Engineer of Installation to develop new higher rated, more flexible test loading apparatus. From their experience these engineers knew that only a water rheostat, utilizing the resistance of brine between two electrodes (conductivity increases with the addition of salt), has sufficient range of adjustment to meet the varying test requirements. It is simple to use, yet compact enough for easy shipment. A water rheostat also offers flexibility, in that, operated alone or in multiples, it can load the wide variety of power plants in exchanges of the same general size. This is important as anything else would complicate administrative procedures of planning, stockkeeping, shipping and accounting, essential to a full test of equipment at a particular exchange.

Additional features of water rheostats that were felt advantageous are that voltage adjustment is unnecessary —one spacing of electrodes can offer a voltage range from 12 to 250 volts, and other adjustments can be made simply. For instance, adjusting to a power plant's full output means only regulating the amount of salt in the brine, and adjusting to fractional currents means merely reducing the effective area of electrodes by moving separators between them.

As developed, the new unit is a three-phase water rheostat rated at 120 kw and housed in a 55-gallon steel drum. It is remotely controlled (using a few watts at 120 volts) for safety and convenience. Normal operation is out-of-doors, controlled from inside the telephone exchange building. Cooling is by city water.

Basic design considerations of the new rheostat have been dictated by the largest power plant in a telephone office—the emergency engine set generating three-phase, 60-cycle power. The rheostat loads three phases in a single container with stainless steel electrodes placed symmetrically.

Current leakage to the container is balanced to place it at ground potential, making insulation unnecessary.

For single-phase and dc use, two electrodes can be strapped together, opposed to the third, reducing the capacity proportionately.

In its construction, the electrodes form a delta load, with the separators extending radially from a hydraulic lift in the center of the container. The cooling unit which transfers heat from the brine to running water is divided into three coils so all three phases are at the same temperature. Flow deflectors placed between each electrode and its cooling coil serve the dual purpose of protecting the coil from the

(Please turn to page 34)

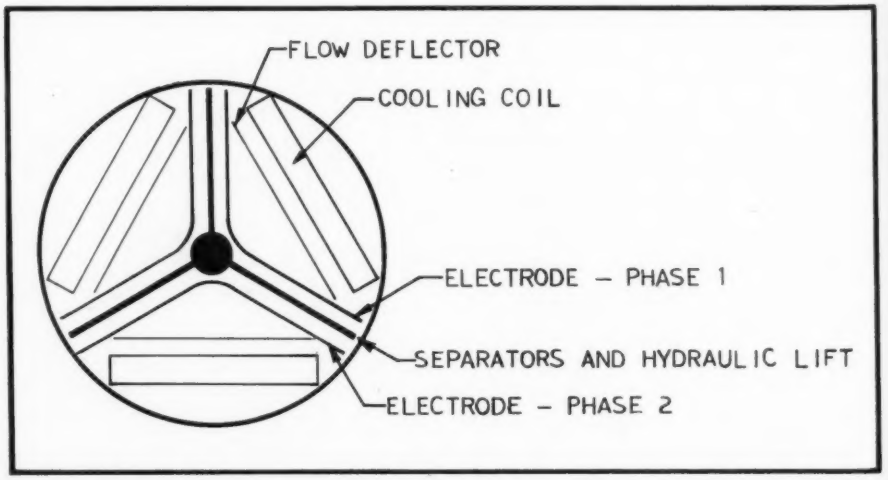
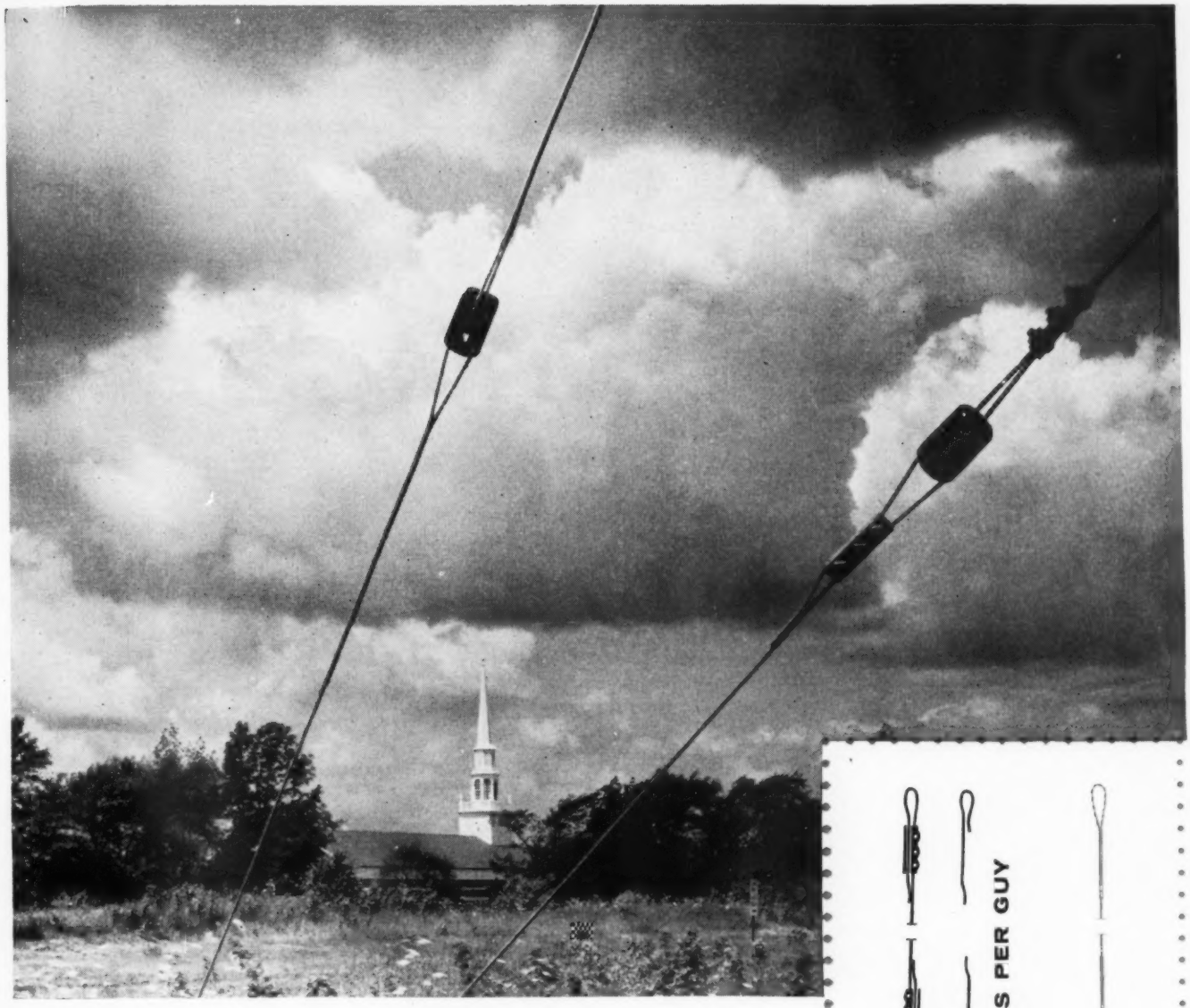
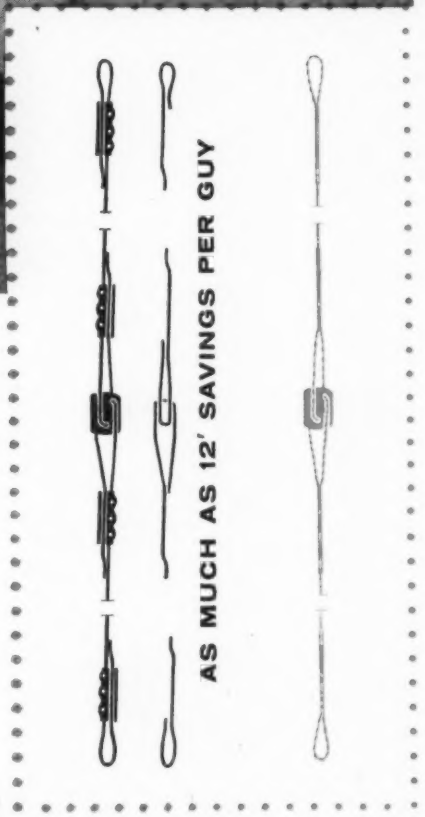


Fig. 1. Diagram of active elements. Electrodes are fixed. Load is controlled by raising or lowering separators between them. Symmetrical construction maintains electrical and thermal balance between the three phases.

*Mr. Lloyd is Power Department Supervisor of Installation Engineering, Western Electric Co., Inc.





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Made in accordance with or for use under U. S. Patent No. 2,761,273; other patents issued and pending.

PREFORMED LINE PRODUCTS CO.

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Telephone: Cleveland EXpress 1-3571

electrical circuit and guiding the flow of the brine into a loop for each phase. An adequate flow of brine is produced by convection within the container.

A hydraulic lift, unique to rheostats of this type, powered by the city water used for cooling, raises and lowers the separators. Lift control is through solenoids, actuated by the 120-volt ac circuit. Power failure to the control circuit allows the separator to drop causing the rheostat to "fail safe."

Temperature of the brine is maintained nearly constant by a thermostatic valve regulating the flow of cooling water. Water lost from the brine is replaced through a float valve with the drain hose doubling as an overflow.

Safe and easy operation were also important design factors of the rheostat. In line with these considerations and as one of the basic improvements, the addition of salt was made semi-automatic. It is accomplished by the opening of dispensing ports only while the raise valve is open and when the separators are in their top position. Regulating the water through these ports controls the amount of salt additive, using the ammeter of the power plant as a guide. The outlet of the salt (actually concentrated sodium chromate) dispenser is in the center of the barrel under the lift so that distribution is equal to the three phases, with immediate delivery to the electrodes minimizing "creepage" of the load current. The method insures only enough salt will be used to fully load the plant under test. Excessive salt, under load, would cause excessive erosion of the electrodes.

Units such as the electrode assembly, the separator assembly, etc., expected to wear in normal use, are interchangeable for easy replacement.

Fig. 3. Side view showing remote controls for hydraulic lift and for adding salt.

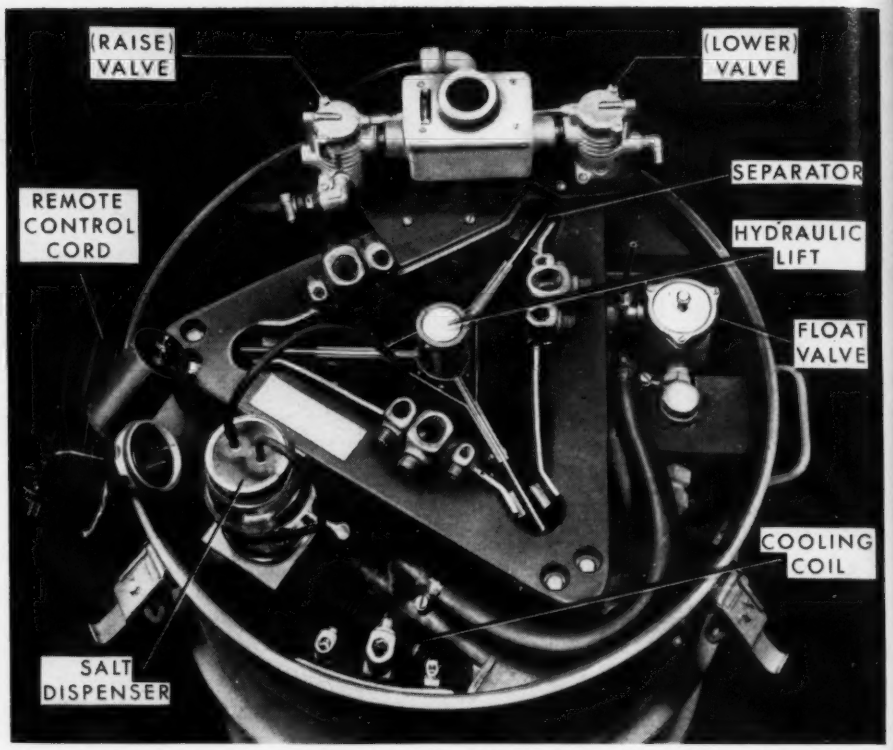

Fig. 2. View from above. The hydraulic lift in the center raises and lowers the separator plates when the solenoid raise or lower valves admit or exhaust city water.

In-work experience with this rheostat has proven it satisfactory for its purpose. Up to 100 kw, most of the heat developed is carried off by the cooling water. Within this range, the rheostat can be used inside. Above 100 kw, increasing amounts of heat are dissipated by evaporation and disassociation of the water in the brine. At 150 kw boiling becomes excessive, marking the upper limit of usefulness.

For several years, 6 to 30 kw water rheostats (using separators between fixed plates) have been used for test loading in installation work. Used in multiples up to five, the evaporative cooled 6-kw rheostat works well with loads from ½ to 30 kw and its use is expected to continue. The 30-kw rheostat is generally outmoded and is being replaced by installation's new unit.

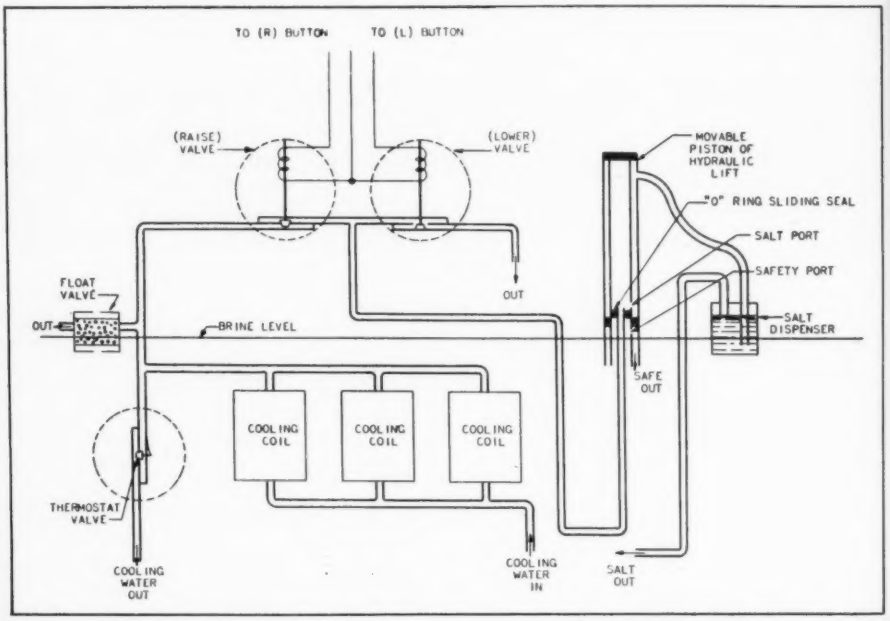

Fig. 4. Hydraulic schematic. City water serves to remove generated heat, replace evaporated brine and power the hydraulic lift and salt dispenser. Oversalting, which results in partial exposure of the electrodes, is minimized because salt can be added only when the separators are in the extreme raised position. An attempt to add salt when rheostat is overloaded causes separators to settle because wide open thermostat valve removes pressure from the raise valve.

XUM

NETWORK . . .

DEFINITION BY DR. SAMUEL JOHNSON (18th CENTURY)—Anything reticulated or decussated, with interstices between the intersections.

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Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

no off-hook complaints

no hard-to-see dials

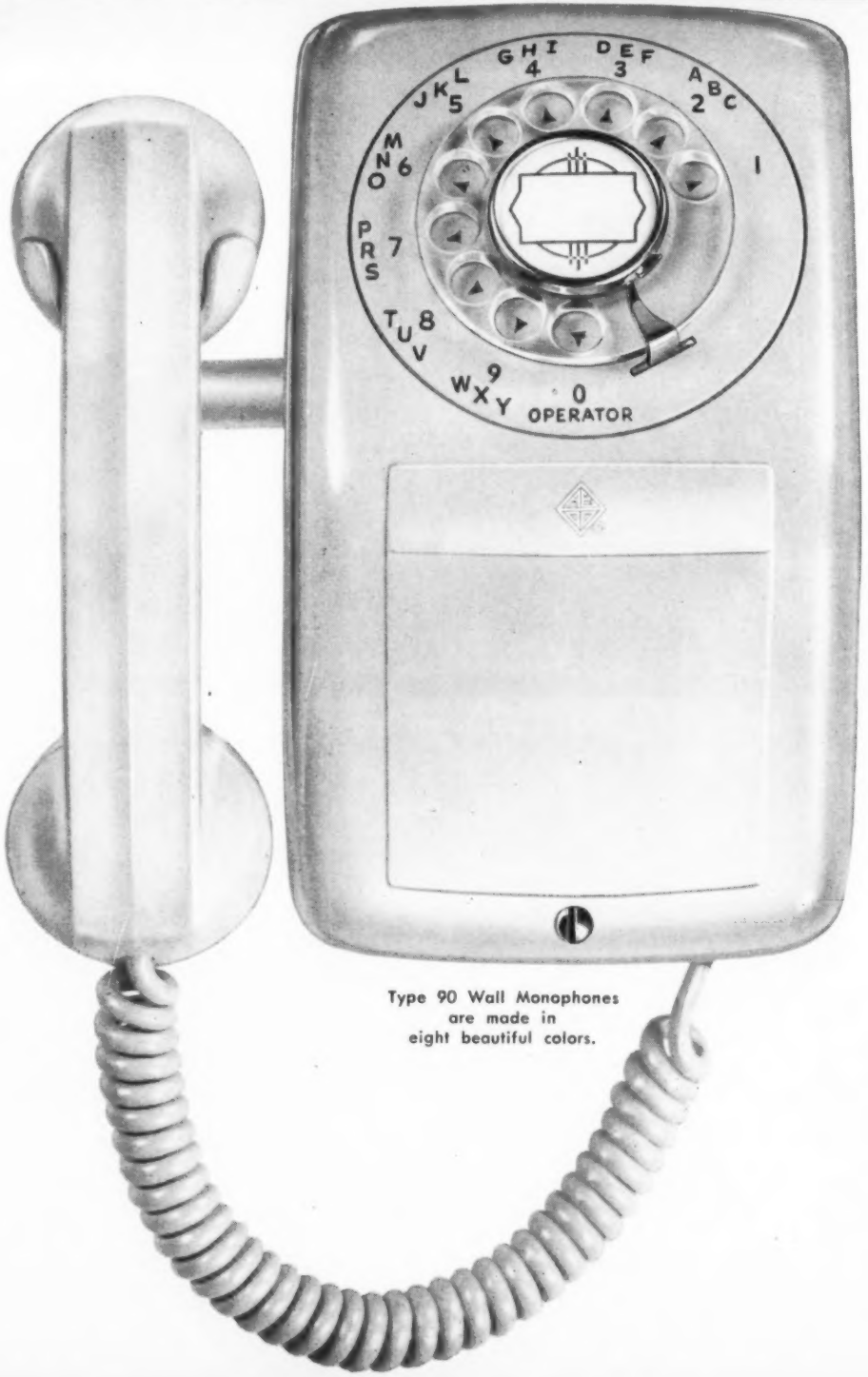
no installation problems

KISS YOUR WALL-'PHONE WORRIES

no ringing complaints

no broken hooks

...ODBYE!



Type 90 Wall Monophones
are made in
eight beautiful colors.

...with Automatic's new Type 90 Wall Monophone

Mister...here's the most practical wall telephone you've ever seen!

No more "off-hook" complaints with this sleek new Type 90. The cradle really wraps itself around the handset. You'll find it's next to impossible to brush, knock or drag the handset off.

The sensible dial angle makes the numbers easier to read, whether you're sitting or standing.

You can install Type 90 in a jiffy. Loosen one screw, the cover's off, and you fasten it to the wall. You don't even have to take the handset off the cradle.

Don't worry about broken hooks, either. The cradle is a sturdy die-casting, the hookswitch lever is inside a die-cast protective tube.

Ringing, as with our Type 80 Monophone, is strong and clear. Space is left between the baseplate and the wall to eliminate drumming.

Write today for Circular 1870 which tells all about this great new wall telephone.

Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

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A member of the General Telephone System
One of America's great communications systems

GENERAL SYSTEM

Merchandising and Forecasting

Feature Nebraska Convention

By Dan S. Fargo

MERCHANDISING, providing good service, and assessing the future of the telephone industry came in for major attention at the 57th annual convention of the Nebraska Telephone Association, held in Lincoln on April 23 and 24. A total of 326 were in attendance.

Association President Kenneth L. Lawson, during presentation of his report, introduced the new secretary of the association, G. E. Nelson, who will take over on June 1. Mr. Nelson is from Webster City, Iowa, and has a background of 21 years in the telephone industry, although his most recent experience has been in the automobile business.

Mr. Lawson said he thought Nebraska's L. B. 54 has a good chance of passing; this is the bill to enable utilities to be reimbursed when relocation of their facilities is necessitated by federal-aid highway construction.

Mr. Lawson recommended that association members contact their congressmen regarding retention of the industry's 750-station exemption under the federal Wage-Hour Law. In commenting on the Hush-A-Phone case, he said:

"As you know, a federal court judge recently handed down a decision to the effect that the Hush-A-Phone or other attachments could be used in conjunction with telephone service so long as they were not detrimental to the quality of service or injurious to the users.

"As a result of this decision, the FCC has ordered tariff filings permitting the use of such attachments insofar as interstate business is concerned.

"It remains to be seen whether or not our tariff filings covering intrastate and local service will have to follow the same pattern.

"In any event, the bars are down and we may expect a rash of gadgets of every description appearing on our instruments. You may rest assured you will not have the opportunity of determining in advance whether or not any particular attachment is injurious to the service.

"Even so, the problem of getting objectionable attachments removed could be costly and certainly a nuisance.

"Your association will keep you advised of any action that should be taken in your tariff filing with the Nebraska Railway Commission."

David A. Hamil, administrator of the REA, gave an address in which he said that from his experience on a cattle ranch he knew what a difference it makes to have good telephone service. He added, "Folks on the farm will use the telephone if they are served well—they'll pick up the telephone and call the folks at home or the kids away at school. As long as they have good service, they'll pay the price and they'll stay with you."

Mr. Hamil pointed out that 7½ years of experience with the REA telephone loan program have led to some improvements and changes in methods. He also mentioned that if a potential REA borrower doesn't have a 10 per cent equity interest in a project, REA will expect to have a say about officers' salaries and dividend payout.

Officers and directors of the Nebraska Telephone Association include, front row (left to right): G. L. Jorgenson of Indianola; F. M. Strasser, outgoing secretary-treasurer; William T. Autry of Grinnell, Iowa, and C. E. Thompson of Dunning. Back row (left to right): K. L. Lawson of Lincoln, retiring president; Vernon A. Allan of Scottsbluff, newly elected president; Clell D. Elwood of Hay Springs; Robert W. Hunt of Blair, and E. J. Lake of Omaha.

XUM

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those old cost estimates!

The low prices of the new Copperweld* Type M Guy Strand make your old cost estimates out-of-date! Copperweld has always given you more years of service per dollar of cost. Now, prices on Type M Guy Strand make first cost lower and more attractive.

Basically, the principle of the new Type M Guy Strand is still the same—each wire has a heavy copper sheath inseparably molten-welded to an alloy steel core. Lower prices result from a new higher strength strand developed by Copperweld research, and from new specialized guy strand production techniques.

Type M Guy Strand is available in 2.2M, 4M, 6M, 8M, 10M, 12.5M and 16M strengths. It is pliable —easy to install. And, because of the molten-weld, the copper will not crack, flake or peel. Write today for complete details about this money-saving product.

*Trade Mark

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WIRE AND CABLE DIVISION *Glassport, Pa.*
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

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New Copperweld TRADE MARK

COPPER MOLTEN-WELDED TO STEEL

TYPE M GUY STRAND

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Left photo: Action at the registration desk. Right photo: Jack Macknemeyer of Sutton; Herb Velte of Lincoln, and Charles Crew of Geneva, partake of some Nebraska hospitality.

He mentioned he'd like to see all telephone companies in a state in one association. In certain states, the REA borrowers, for example, have an association by themselves. "I'm sure the problems here in Lincoln are the ones which also hit the folks in the country," he concluded.

"Leadership—A Sacred Trust" was the area explored in a talk by Herbert A. Ronin, Lancaster County judge. He stated that all who have positions of authority can continue to improve their leadership ability. One's inner qualities, he said, are most important; and several of these can be improved by study and training—among them, emotional maturity, sociability, self-confidence, education and aggressiveness.

Judge Ronin offered the following areas for improving one's leadership capabilities:

(1) Improving one's ability to plan.

(2) Development of a proper human relations attitude.

(3) Shaping a constructive community attitude.

(4) Keeping oneself physically fit.

(5) Improving one's understanding of parliamentary law.

Judge Ronin also reviewed the West Point commandments of leadership and related them to the telephone business. These are:

(1) Know your job.

(2) Take responsibility for your actions regardless of their outcome.

(3) Set the example.

(4) Seek responsibility and develop a sense of responsibility among subordinates.

(5) Make sure the task is understood, supervised, and accomplished.

(6) Know your men and look out for their welfare.

(7) Keep your men informed.

(8) Know yourself and seek self-improvement.

(9) Train your men as a team.

(10) Employ your command in accordance with its capabilities.

Judge Ronin stated: "The opportunity to serve in a position of leadership is one of the supreme satisfactions of life, and a successful career as a leader is its own reward."

Exchanging views between sessions of the Nebraska convention are (left to right): John C. Ahlstrand of Omaha; Vic Hall; D. E. McGregor of Gibbon; Gard Pierce of Sargent, and Taylor Withrow of Grand Island.

W. D. Quinn, sales supervisor of Lincoln Telephone & Telegraph Co., stands next to the display board he used to emphasize a new concept in merchandising telephone service.

Following Judge Ronin's talk, the Bell System movie, "Our Mr. Sun," was shown.

In speaking about "Selling Telephone Service," William D. Quinn, sales supervisor, Lincoln Telephone & Telegraph Co., remarked: "It is imperative that we accept a new concept in merchandising if our industry is to show continued growth and financial strength in the years that lie ahead.

"To take a look at the 'big picture' we must project our thoughts into the future, say 10 years, and become acquainted with some of the forces at work behind the scenes that are leading up to the necessity for this new concept," he said. The forces cited by Mr. Quinn were:

(Please turn to page 51)

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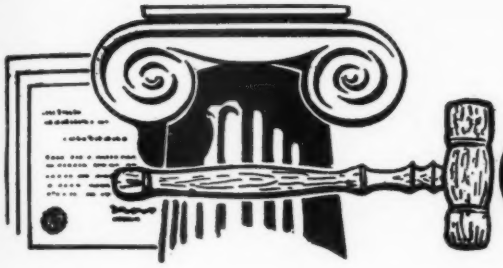


Courts and Commissions

Illinois Commission Approves Four Sales

The Illinois Commerce Commission recently granted authority to the Inland Telephone Co., Champaign, to acquire all the properties of the Moweaqua Telephone Co., and to acquire all subscriber-owned lines and facilities owned by the Kempton Telephone Co.; also to acquire the exchanges of Cullom, Kempton and Charlotte, together with the subscriber-owned lines of the Farmers Telephone Co. to which switching service is rendered by the Kempton company.

The commission also extended authority to the Mulberry Telephone Co., Mulberry Grove, to purchase all the properties of the Vandalia & Southwestern Telephone Co., Pittsburg. Norman Gum is president of the Mulberry company.

Southern Bell Allowed Temporary Raise in Tenn.

Tennessee's supreme court on May 3 granted a motion by Southern Bell Telephone & Telegraph Co. permitting it to put into effect temporary rate increases under bond pending a decision on an appeal from a Davidson County Chancery Court ruling (TELEPHONY, May 11, p. 44).

At the same time, the court set June 6 to hear the case on its merits.

The temporary increase ordered by the court gives the company the full 9.8-million-dollar increase it first requested on Nov. 10, 1954.

The Tennessee Public Service Commission on Feb. 15, 1956, allowed the company a $2,996,000 annual increase. On Feb. 26, former Chancellor Thomas W. Steele ruled the company should have the additional $6,804,000. This ruling was appealed to the state supreme court by the commission.

Requests Loan OK in N. C.

North Carolina Telephone Co., Matthews, asked the North Carolina Utilities Commission on May 14 for authority to borrow 1½ million dollars from Stromberg-Carlson Co. to retire outstanding indebtedness and to continue modernization of its equipment and facilities.

Ohio Commission Acts on Four Pleas

The Ohio Public Utilities Commission on May 16 was reported to have taken the following action:

It authorized the Northern Ohio Telephone Co., Bellevue, to capitalize uncapitalized net additions as of December 31, 1956 in the amount of $4,564,998, the character and amount of securities to be issued to be determined at a subsequent period.

•

The Arcadia Mutual Telephone Co. received commission consent to offer optional dial service rates preparatory to the company's conversion to automatic. The present magneto rates and the proposed optional automatic rates are as follows:

	MAGNETO	
	Business	*Residence*
One-party	$5.00	$4.00
Two-party	—	—
Five-party	—	3.00

	AUTOMATIC-OPTIONAL	
	Business	*Residence*
One-party	$5.25	$4.25
Two-party	4.75	3.75
Five-party	4.25	3.25

•

The General Telephone Co. of Ohio, Marion, has been authorized to issue and sell 200,000 shares of its no par common stock with the stated value of $5.00 per share, a total of one million dollars.

Also, the company was authorized to issue its first mortgage bonds in the principal amount of 3 million dollars, said bonds to be sold at the best price obtainable but not less than 100 per cent of the principal amount and shall bear interest at the rate of 4¾ per annum.

The company also was authorized to retire its presently outstanding short-term notes in the principal amount of $3.7 million dollars. The remaining amount of the proceeds from the sale of the common capital stock and bonds is to be used to reimburse the company's treasury.

•

The commission also has extended approval to the Home Telephone Co., Fairview, for the sale of 5¼ per cent first mortgage bonds, series 1957, in the aggregate principal amount of $200,000, to be date May 1, 1957, due and payable May 1, 1977.

The sale is to be used to retire the company's presently issued and outstanding short-term notes in the aggregate principal amount of $195,000, the remainder to be used to reimburse the company's treasury.

Minnesota Commission OKs Three Rate Increases

Minnesota's Railroad & Warehouse Commission on May 7, 9 and 10 authorized rate increases for the Wendell Telephone Co., The Halstad Telephone Co., and the Twin Valley-Ulen Telephone Co., respectively.

Total operating revenues and net operating income, both before and after rates take effect, as well as other operating figures are given below for the three companies:

	Halsted Telephone Co. (Fisher exchange)	Twin Valley-Ulen Telephone Co.	Wendell Telephone Co.
Total Operating Revenues			
Before	$ 3,298	$ 64,195	$16,523
After	$ 6,524	$100,994	$18,576
Net Operating Income			
Before	$ 712	$ 10,975	$ 340
After	$ 2,019	$ 28,217	$ 1,577
Rate Base	$35,000†	$583,692	$35,000†
Rate of Return	5.6%	4.83%	4.5%

Stations Served

	Before Conversion	After Conversion		
Local	84	97*	587	167
Rural	—	—	764	202
Switched	—	—	—	69

†Original Cost

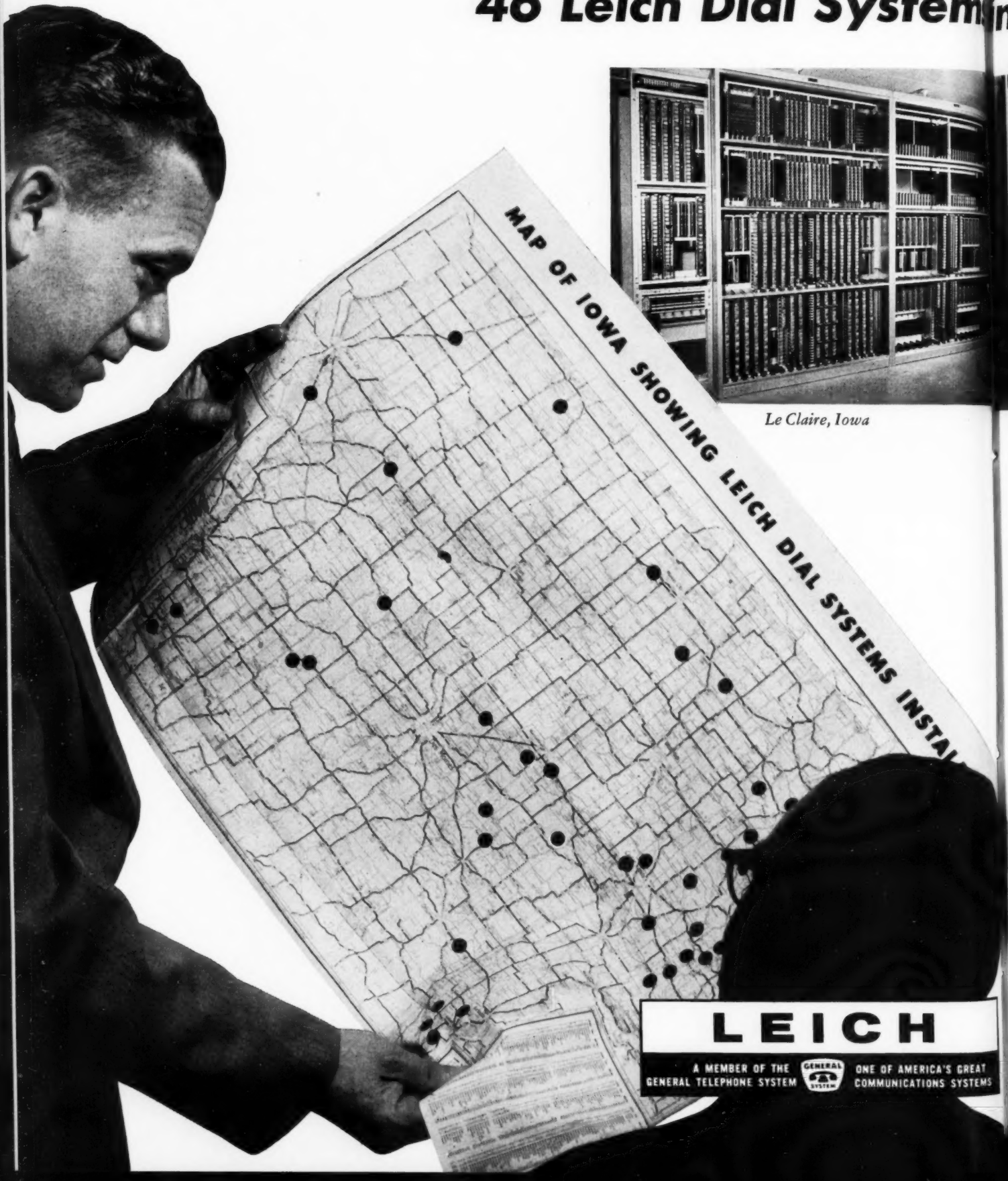
*Upon completion of the project, extended area service will be offered between Fisher and Bygland and between

(Please turn to page 44)

Did you know there are

46 Leich Dial Systems in

Le Claire, Iowa



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A MEMBER OF THE GENERAL TELEPHONE SYSTEM — ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

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in Iowa?

Sloan, Iowa

The first Leich Dial System was installed in Iowa in 1948. Installation has followed installation until today there are 46 exchanges using Leich Dial Systems.

Here's why these Iowa exchanges have decided Leich was the best bet for fast, profitable conversion to dial switching.

For example, the Leich Dial System is economical. It's an all-relay dial switchboard. It eliminates elaborate mechanical switching mechanisms that wear and require adjustment. Maintenance costs stay low.

Expansion is easy. Your own switchboard man can jack-in 10 lines in 15 seconds. You don't have to pay for factory installers, soldering, and wiring. The only expense is the cost of the equipment you add — only $172.90 for a 10 line relay bar.

Write for the Leich Dial System catalog which gives you the complete story. Ask for a quotation if you wish. There's no obligation.

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Fisher and the Grand Forks, N. D., exchange of the Northwestern Bell Telephone Co.

Milwaukee Attorney Sues Over Directory Omission

A Milwaukee, Wis., attorney whose business telephone number and address were omitted from both the regular and yellow sections of the new telephone book has asked the circuit court to help him remedy the wrong, it was reported May 10.

Robert F. Kirst is not listed in the recently distributed Milwaukee directory as an attorney nor is his business telephone listed.

In a suit started by his law partner, John L. Newman, Mr. Kirst on May 9 asked the court to order the Wisconsin Telephone Co. to print an erratum sheet correctly listing the missing information and mail the sheet to all of its subscribers.

If the court should not do that, Mr. Kirst asks that the telephone company be ordered to pay him $20,000 so that he can have the sheets printed himself and mailed.

William E. McGavick, general counsel for the Wisconsin Telephone Co., admitted that an inadvertent omission had been made.

"We've tried to make an adjustment with him but he doesn't want that," McGavick said. He said the telephone company's liability was limited to no more than Kirst's telephone bill.

Independent Asks Financing

The New York Public Service Commission on May 15 was scheduled to hear the petition of Warwick Valley Telephone Co. for authority to issue additional first mortgage bonds and common stock.

Kansas Company Asks Raise

The Kansas Corporation Commission on July 9 is to hear application of the Atchison County Mutual Telephone Co., Muscotah, for a $2,088 rate increase to some 209 customers. This would amount to a 50 per cent increase, a commission spokesman reported.

Ill. Company Asks Financing

The Illinois Commerce Commission on May 21 was to hear the application of the Pocahontas Telephone Co. for authority to issue $2700 of its $50 par common stock, and to issue a promissory note for $3800.

Applause for Performance

"Our industry enjoys the enviable and somewhat unique position of having to work hard, year in and year out, to stay ahead of growing demands for service. All of us can take pride in this; the public would not keep coming back for more if we were not doing a good job. We have every reason to look to the future with confidence."—ROY GIBSON, president, Hartford Electric *Light Co.*

Obituaries

MICHAEL A. HIGGINS, an executive of the General Telephone System is dead. He died at St. Francis Hospital in Evanston, Ill. Burial was in Orange, N. J.

Born in Irvington, N. J. in 1898, Mr. Higgins received his early education in Newark and then attended Fordham University in New York City.

M. A. HIGGINS

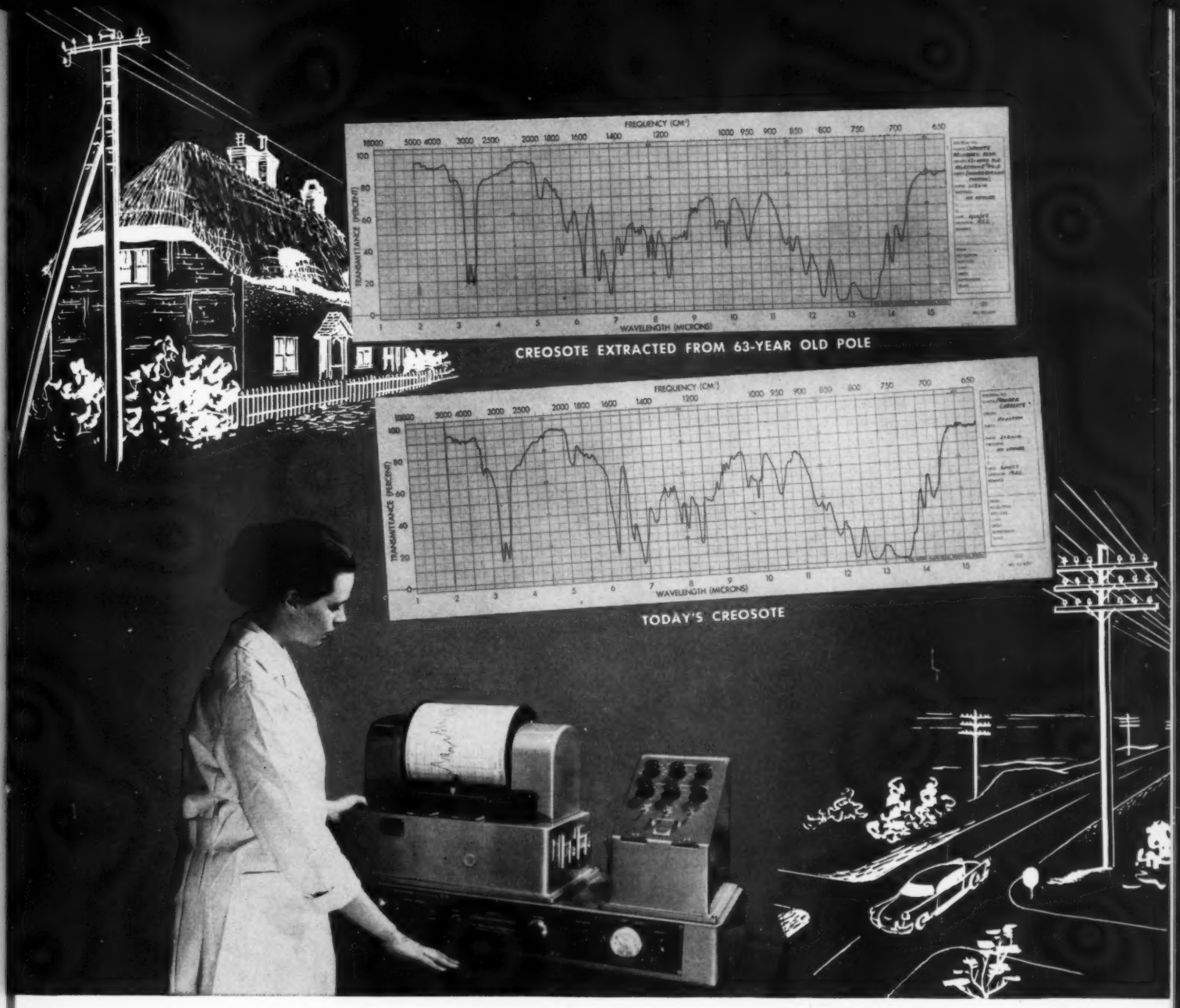
He began his telephone career with the New York Telephone Co. and remained with the Bell System for the next 15 years.

At one time or another during his Bell years, he held positions in maintenance, installation, construction and engineering.

In 1936, he joined the Gary Group of telephone companies (now part of the General Telephone System) serving first with the Illinois Central Telephone Co., Clinton, Ill., later going to the Gary Group headquarters office in Chicago where he was a vice president in charge of telephone companies operating in Illinois, Wisconsin, Minnesota, Iowa, Missouri, Nebraska, Georgia and South Carolina.

He is survived by his wife, Vera; two daughters, Elizabeth and Mrs. Michele Cohig, and two sons, Robert and John.

(Please turn to page 48)



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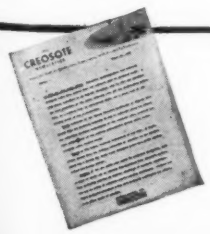
. . . the modern preservative with a proved record

Secrets of 63-year pole life unlocked in laboratory

The 63-year old English telephone pole which Koppers Tar Products Division representatives brought to this country recently was an outstanding example of the long service which only pressure-creosoted wood can document. Intensive laboratory investigations have been conducted on this pole to determine, among other properties, its retention of preservative and the chemical composition of the creosote used in its treatment.

Preliminary findings are now available . . . and infra-red spectrophotometer comparisons of modern creosote with creosote extracted from the old pole tell a dramatic story! As you will note from the spectra in our illustration, the creosote which protected this Scots pine pole for 63 years is practically identical with today's creosote.

One conclusion is obvious: the creosote treatment you specify for your wood investment today will give the same long life as that typified by the 63-year record of the English pole. What better evidence that creosote is, truly, the 50-year-plus preservative.



To keep abreast of news on wood preservation, you'll want to receive these periodical reports on Creosote. Just drop us a note and we'll put you on the mailing list.

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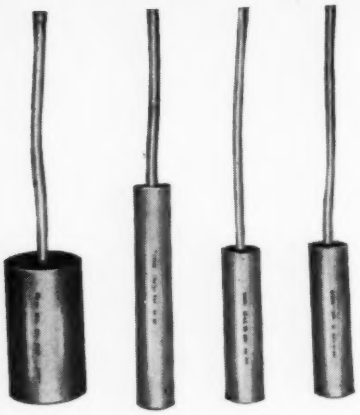
TAR PRODUCTS DIVISION

Pittsburgh 19, Pa.



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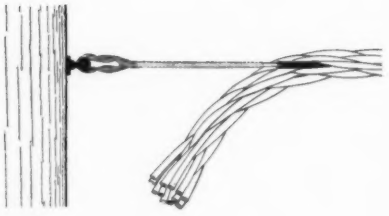

Preformed Dead-Ends for Telephone Line Wires and Rural Distribution Cable Messenger. No tolls required, can be installed without cutting wire. Available in galvanized steel, copperweld, stainless steel and bronze. PREFORMED LINE PRODUCTS COMPANY.

A GALLERY OF MASTERPIECES OF FINE LINE EQUIPMENT

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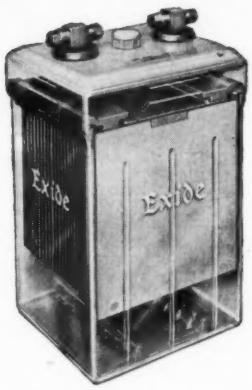
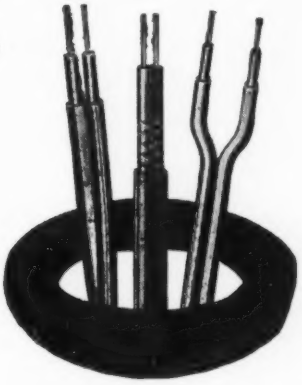
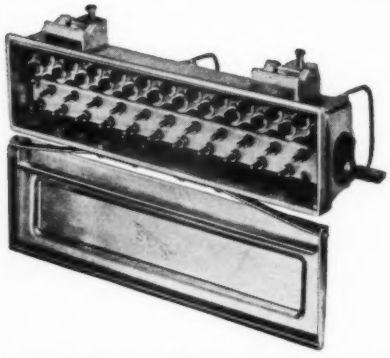


Big Capacity in Small Size. Unique positive plate in Exide-Tytex Battery has large area of active material that results in high capacity. Exclusive patented Silvium grid resists corrosion — prolongs battery life. Taperless plastic jars save one-third space. Exide Industrial Division, THE ELECTRIC STORAGE BATTERY COMPANY.



Long Service Life and Low Plant Costs go hand in hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in both Copperweld and Bronze. This flexible and easy-to-handle wire is made by GENERAL INSULATED WIRE WORKS, INC.



Strand Mounted Terminals—providing new Reliable Fuseless Protector Unit for station or cable protection. Static discharges are dissipated across the elements to ground. With repeated heavy discharges —from fault currents or power surges— carbons are shunted as the attendant heating permanently closes a metallic circuit to ground. Made by RELIABLE ELECTRIC COMPANY.

Kellogg's Standard Outside Plant Handbook now available at special price while quantities last. Reduced to $2.75 a copy, with ten or more copies priced at $2.50 each. Every phase of outside plant telephone pole line construction is covered in book.

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XUM

WALTER H. WARREN, 71, a deputy minister of telephones in the Saskatchewan government for 17 years, and a former president of the Telephone Association of Canada, died May 12.

Born in Granby, Que., where he was educated, Mr. Warren went to Winnipeg in 1904 and was with Bell Telephone Co. of Canada, before joining the Saskatchewan government service in 1909. He was a resident of Moose Jaw and Saskatoon before going to Regina.

Mr. Warren was made deputy minister of the department in 1930. He was for many years an executive of the Trans-Canada Telephone System and was twice president and for years a member of the board of directors of the Telephone Association of Canada.

•

Recently JOSEPH P. WESTON, manual circuit design supervisor at Stromberg-Carlson, a division of General Dynamics Corp., was one of four employes saluted for long, faithful service in the telecommunication division of the company. A few days later, on May 5, Mr. Weston died.

Certain PBX circuits which have since become industry-wide standards were developed by Mr. Weston. Also, he was known by those he supervised for his approach in helping them advance: never giving the direct solution to a problem, but through skillful questions and timely suggestions aiding the novice to work out his own answer.

Mr. Weston was born in Webster, N. Y. in 1892. Upon graduation from Cook Academy in Montour Falls, N. Y., he joined Stromberg-Carlson in 1912 as a switchboard stock room clerk. Later he was assigned to switchboard wiring, progressed to inspector in this department, and in 1925 moved to the engineering department as a member of the circuit design group. Ten years later he was appointed supervisor of manual circuit design. At the time of his death, Mr. Weston held the longest service record of any regular employe in the engineering department.

He is survived by his wife, Ella; a sister, and four brothers.

Results of Big Government

"The evidence is that individual initiative decreases as government initiative increases; that private spending goes down as government spending goes up; that individual liberties decline in proportion to the areas government takes over."—EDITORIAL STATEMENT, *The Wall Street Journal.*

U. S. Instrument Appoints M. A. Byrd Sales Manager

Marvin A. Byrd, for the past five years general manager of the Mansfield (O.) Telephone Co., has been appointed sales manager of the United States Instrument Corp. at Charlottesville, Va.

M. A. BYRD

At USI Mr. Byrd will be responsible for all sales of the company's telephone equipment line.

Mr. Byrd entered the telephone industry in 1935 with the Telephone Service Co. of Ohio.

In 1940 he joined the Ohio Bell Telephone Co. in its toll central office equipment department, and remained with that company until October 1944, when he became associated with the Kellogg Switchboard & Supply Co.

Mr. Byrd was sales manager of Kellogg's eastern division when he left to take over his duties as general manager of the Mansfield Telephone Co.

A native of Bellefontaine, O., Mr. Byrd attended school in Lima, Ohio and night sessions at the Akron University, as well as other specialized training schools.

Destruction in Disguise

"If the capitalistic system in the United States is in danger today, it is not the danger from a frontal attack. It is the danger that it will be loaded with so many forms of government intervention that it will no longer be able to perform its function; the destruction will not take place if people realize that the purpose is destruction. But it can come about piecemeal, and with the consent of people who would be horrified if they realized what was afoot."—WILLIAM H. GRIMES, *Editor, The Wall Street Journal.*

Light-Weight Aluminum Castings

make the Coffing Aluminum Super Power the lightest hoist in its class

Coffing Super Power hoists are available with aluminum castings which reduce their weight without sacrificing strength. Both 1½ and 3 ton models are more than 20% lighter than any other hoists in their class.

Super Powers, which also are available in malleable iron in capacities from 1½ to 5 tons, have sealed-in lubrication for moving parts and require a minimum of maintenance. Overload testing, "Safety Valve" handles, and constant load-locking ratchet-and-pawl assure safe operation. For complete details, consult your Coffing distributor or write to us for Bulletin L-3. **Coffing Hoist Division, Duff-Norton Company, 808 Walter Street, Danville, Ill.**

Independent telephones help you reach all America

The patient is doing fine. And so is Mom—thanks to that reassuring telephone call. In so many ways each day, the swift, personal, *indispensable* telephone proves its value. Haven't you a call to make . . . right now?

Throughout two-thirds of the entire area of the nation, the service you depend on is provided by 4,500 independently owned and operated telephone companies. Working together to serve you better.

60 Years of Growing Service 1897-1957

INDEPENDENT TELEPHONE COMPANIES of America United States Independent Telephone Association • Pennsylvania Building • Washington, D.C.

This 36th USITA national ad appeared in May 13 Time and May 24 U. S. News and World Report

construction and maintenance DIGEST

- **Lead in reserve**
- **Anti-aging cable**
- **Certain current**
- **25-year proof**

Published regularly to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson Company

Two dividends are yours when you order supplies from Stromberg-Carlson. First, you get the protection of a double guarantee—ours and the maker's. This assures you of getting the finest products, backed by our 62-year reputation. Second, your support is used to further the art of telephony. We're knee-deep in this industry as a full-time job, not a side line, and your supply business plays a big part and helps us continue our research for new and better telephone equipment.

Reserve lead keeps battery young

Inside the unique lead buttons in an Exide-Manchex positive plate there's a coil of reserve lead designed to prolong battery life. Over the years, as this lead is needed, it goes into action, instantly and automatically.

The unique thing about Exide-Manchex construction is that the reserve lead does not have to support the plate. The spiral lead buttons are tightly locked into a cast lead-antimony alloy grid several times more rigid than pure lead. Hence the reserve lead can be completely consumed while the plate retains its strength.

Only Exide-Manchex Batteries have this construction. In addition, they feature a plastic jar that saves weight and space, high level electrolyte for less frequent filling, and huge bottom reservoir that virtually insures against sediment shorts.

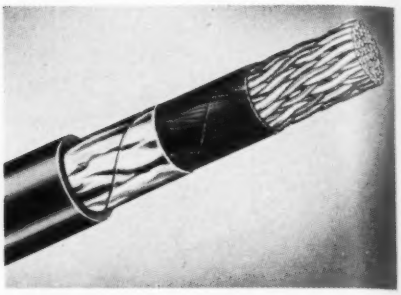
Cable has polyethylene sheath for extra-long life

In outside cable installations, you can side-step the ravages of weather, sunlight and temperature, saving yourself many dollars and hours in maintenance.

To do this, use the protection of the polyethylene sheath on Whitney Blake Telecable®. Telecable exchange area cable for aerial and duct use has polyethylene insulation and polyethylene sheath. No other thermoplastic material has given as good assurance of aerial cable sheath life expectancy as has polyethylene.

Specially treated to resist sunlight, the Telecable sheath has maximum chemical resistance, is not subject to environmental cracking.

Extremely light in weight, tough, yet flexible, it resists the stresses encountered during installation. You can expect top performance of Telecable for upwards of 20 or 25 years.



Telecable exchange area cable has outstanding weather resistance and transmission qualities.

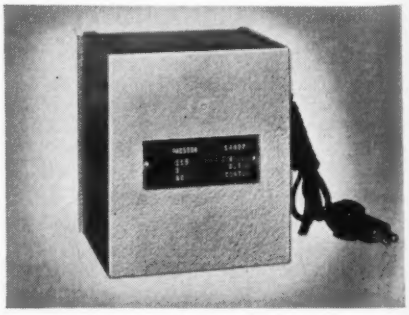
Available in No. 24, No. 22 and No. 19 A.W.G. in sizes up to and including 404 pairs. For further information, consult your Stromberg-Carlson representative.

Battery eliminator gives you DC, even if your AC source fails!

If you want 24-hour guaranteed direct current, you can get it with the Schauer Battery Eliminator.

This unit gives you the assurance and security that, no matter what might temporarily interrupt your alternating current source, you will still get a steady flow of direct current.

This battery eliminator, the PA-05004 type illustrated, is designed specifically for use on the operator's



Schauer Battery Eliminator has built-in Power-off Relay.

circuit on magnet switchboards.

When operating from 110-volt, 60-cycle lighting circuit, it delivers a constant, humless direct current. If the alternating current supply fails, a built-in Power-off Relay automatically transfers the operator's circuit to stand-by dry cells.

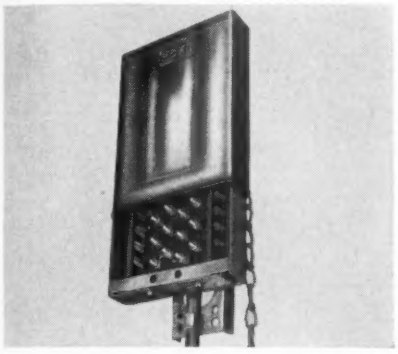
XUM

Other models available for Lamp Signal (PBX) and Automatic (PAX) systems. Products of Rectifier Division, Schauer Manufacturing Corp.

Order from your Stromberg-Carlson representative.

Time-Tested, Time-Proved

More than 25 years of use have brought world-wide acceptance of the Cook XB Unprotected Cable Terminal for high insulation characteristics and wiring convenience.



Available in 6, 11, 16 or 26 pairs with or without lead stub.

Some of the features of this terminal are heavy steel terminal box and bracket, galvanized to prevent rusting; close-fitting reversible hood of heavy sheet zinc; non-corroding Everdur studs deeply embedded in a patented one-piece Bakelite face plate; and raised stud mountings. Cook Electric Company can furnish this terminal with a detachable mounting bracket.

For intensely corrosive atmosphere and resistance to salt spray the XB Terminal is available with all metal parts made of silicon bronze.

Did you know . . . that the Stromberg-Carlson general catalog has more than 100 pages of maintenance and construction supplies alone? You can do *all* your business "under one roof" and find the same quality and reliability in every item.

Distributed by

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

NEBRASKA CONVENTION

Continued from page 40

(1) *An increase in our national productive capacity.* This capacity is expected to increase by 50 per cent in the next 10 years.

(2) *Increase in individual spending power.* The amount of income left over after taxes and basic living costs is nearly six times as great today as in 1940. This extra buying power is dependent upon the desire of the individual for a selective choice of a variety of items over and above the bare necessities.

(3) *Increase in family income.*

(4) *Decrease in private debt ratio.* Private debt has declined from 176 per cent of a year's production in 1930 to 96 per cent in 1956.

(5) *Increase in number of births.* Population is growing at about 240,000 per month.

(6) *Redistribution of age groups.*

(7) *Education for greater numbers.* Number of adults with a high school education is five times greater than in 1930 and has increased 98 per cent since 1940. Higher educational level should encourage desires for a higher standard of living.

(8) *Greater interest in the family as a unit.* Trend toward increased family life and home living will bring about substantial expenditures for this type of living. The trend is reflected in: increased number of families; greater percentage of population being married; marriages at an earlier age; greater number of families having children; increase in home ownership, and increased suburban development.

(9) *Greater number of women workers.* This supplements the family income and contributes to a higher standard of living, as well as increasing total national production. It also provides activity for the housewife with spare time on her hands as a result of the push-button appliance era.

(10) *New shelter for millions of new homemakers.* Another housing boom is in the offing. With nearly 50 per cent of our homes more than 30 years old, new homes and re-modeled older homes will provide a huge market for new services.

(11) *Mass movement of millions to new or different living quarters.* Every family moving to different quarters is a potential for additional goods and services.

(12) *Decreasing farm families.* Farm population has declined around 10 per cent since 1940, but farm production has increased nearly 33 per cent in the same period. This change in production per farmer has resulted in a higher income per farmer and has eliminated many low-income farmers. A higher standard of living and greater financial stability is now possible for the remaining farm families.

Mr. Quinn commented: "We have a terrific job to do in changing customer habits and expanding sales. We must raise our sights in selling—not in relationship to the past—but in view of the new and changed opportunities. . . . If we have finally become aware that we do have competition in our business, then let's act like we have competition."

To implement the telephone merchandising program, Mr. Quinn recommended three means. First, marketing: find out what the customer wants and make every effort to provide this service for him.

Second, supply: more realistic estimates of equipment requirements are needed. There is a considerable loss of monthly revenue between the selling date and the installation date, he said.

Third, selling: a combination of employe sales participation and specialized sales personnel must be provided for maximum selling efficiency. A thorough sales training program for sales personnel is a must if companies are to compete with their competitors, he stated.

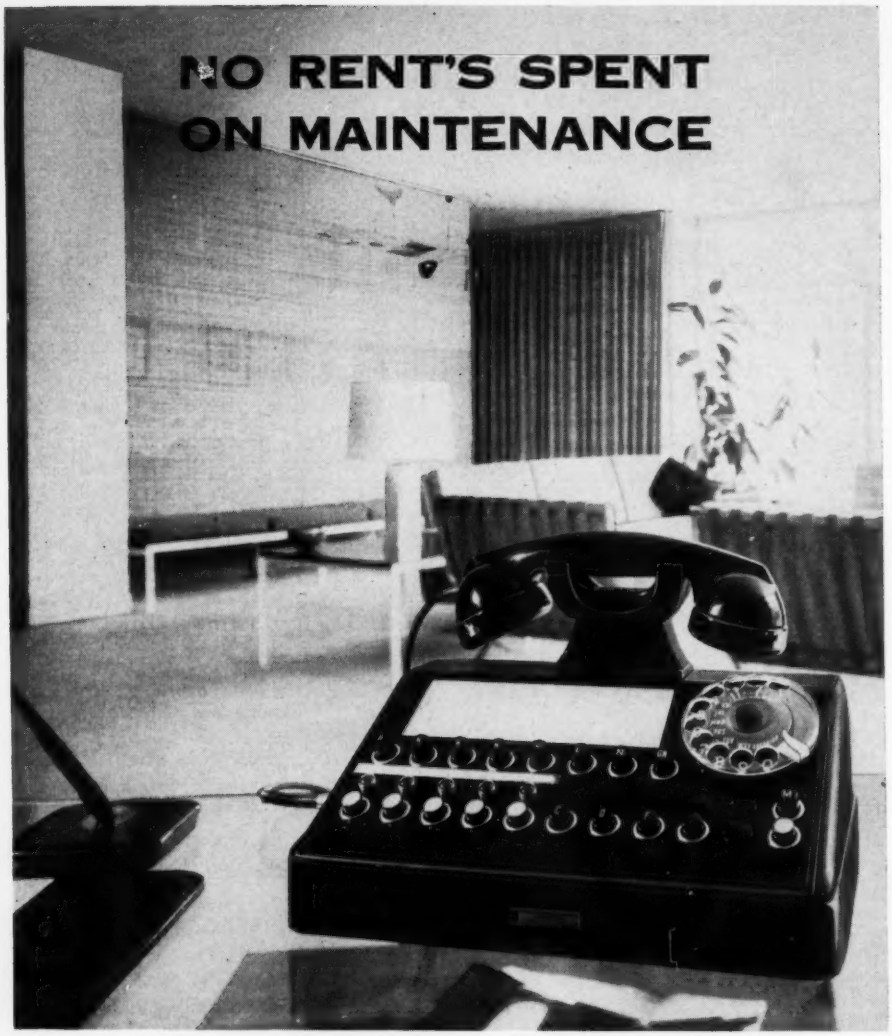
John A. Bonebright, director of accounting and engineering departments, Nebraska Railway Commission, discussed "Service and Accounting Requirements." Included in his talk was a description of various financing methods open to companies desiring to convert to dial service, expand or purchase other properties.

Mr. Bonebright also pointed out that it simplifies accounting procedure if a company is incorporated, because in a proprietorship or partnership, it is sometimes difficult to keep private transactions separate from the company's.

He also stated that financial reports filed with the commission are good for the operating company in that they inform the managers whether the property is making or losing money, since one cannot judge this just from the amount of money in the bank.

Talking on "New Developments and Things to Come," G. A. Holmes of Omaha, Northwestern Bell Telephone Co. district manager, said, "From all I hear and read, we are on the threshold of a vast change in the telephone art—in the foreseeable future, and principally because of the transistor-silicon junction diode and the thermistor."

To illustrate, Mr. Holmes said that a relay-type central office serving an average number of business lines would require seven common control circuits; whereas a single electronic common control—with the silicon junction diode acting as a switch, and



IT'S CLEAR PROFIT WITH **PBX**
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Close to zero maintenance! That means your monthly rental revenue is close to 100% profit when you install the rugged Type 30 PBX by United States Instrument.

FEATURES YOU LIKE:

Relays with long-lasting twin contacts of precious metal.

Compact rotary and rectangular motion switches with twin bifurcated wipers.

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Parts delivery overnight to most points.

SUBSCRIBERS LIKE:

Busy-lamp field for at-a-glance check of stations in use.

Trunk calls transferred with push-button ease by stations.

Key senders pulse automatically on larger systems.

Incoming calls stored and put through automatically.

Write today for our catalogs:

UNITED STATES INSTRUMENT CORPORATION

P. O. Box 33-T, Charlottesville, Virginia

coupled with electronic components—would be adequate to serve 25 such central offices of this type.

Mr. Holmes described the silicon rectifier as an item about the size of a pea, and said when two of them are linked together and mounted on a cooling fin, they can furnish more than 20 amperes of direct current at 100 volts.

In terms of power, he said, the two can furnish 2,000 watts with only a 20-watt heat loss. In addition, the silicon rectifier embodies advantages of low maintenance, low power factor and an extended lifetime.

He also covered Time Assignment Speech Interpolation (TASI), the thermistor and several predictions. In conclusion, he said:

"All of us here have helped to carry out the traditions handed down to us. I am sure that these new developments will contribute to the inspiration of telephone men and women everywhere.

"Such inspiration will perpetuate the telephone industry for years to come and continue to make it one of the most vital parts of the American economy."

The following new directors were elected: Clell D. Elwood of Hay Springs; John E. Kaldenberg of Burwell, and E. J. Lake of Omaha. K. L. Lawson, last year's president, becomes an ex officio director. Retiring directors are John C. Ahlstrand of Omaha and Pat J. Carey of Petersburg.

The directors elected the following officers: President, Vernon A. Allan of Scottsbluff; vice president, C. E. Thompson of Dunning, and secretary-treasurer, G. E. Nelson.

Answers to Questions On Page 24

(1) If BY is encountered, the operator will give the report to the calling party and ask him to hold the line.

(2) The operator should monitor long enough to assist in starting conversation if necessary.

(3) The operator should monitor at frequent intervals, at least once every 15 seconds, for the end of conversation.

(4) The observation post observer places a call by saying, "Aircraft Flash," followed by the calling telephone number.

(5) The observation post observer will place his call with the first operator reached.

Bell Laboratories researchers Henry S. McDonald, Dr. Eng. from Johns Hopkins, and Max V. Mathews, Sc.D. from M.I.T., examine magnetic tape used in new research technique. Voice waves are converted into sequences of numbers by periodic sampling of amplitudes, 8000 samples per second. General purpose electronic computers act on these numbers as a proposed transmitting device might.

They send real voices on imaginary journeys

In their quest for better telephone service, Bell Laboratories researchers must explore many new devices proposed for the transmission of speech signals. For example, apparatus can be made to transmit speech in the form of pulses. But researchers must always answer the crucial question: how would a voice sent through a proposed device sound to the listener?

In the past it often has been necessary to construct costly apparatus to find out. Now the researchers have devised a way to make a high-speed electronic computer perfectly imitate the behavior of the device, no matter how complicated it may be. The answer is obtained without building any apparatus at all.

The researchers set up a "program" to be followed by the computer. Actual voice waves are converted into a sequence of numbers by sampling the waves 8000 times per second. Numbers and program are then fed into the computer which performs the calculations and "writes out" a new sequence of numbers. This new sequence is converted back into real speech. Listeners hear exactly how well the non-existent device could transmit a real voice.

With this novel technique, new transmission ideas are screened in only a fraction of the time formerly required. Thus valuable time and scientific manpower are saved in Bell Laboratories' constant search to provide still better service for telephone customers.

BELL TELEPHONE LABORATORIES

World center of communications research and development

TAKE A BIG STEP TOWARD **SAFETY**
WITH **DUO-SAFETY LADDERS**

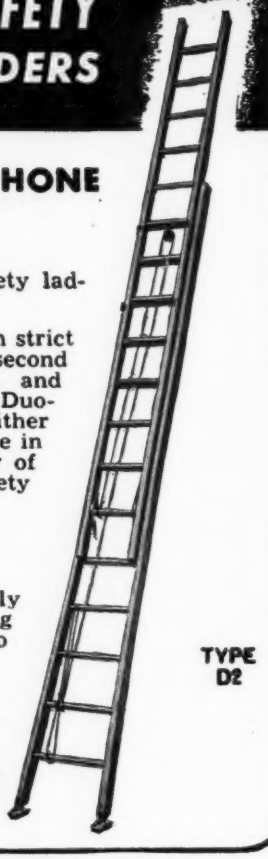
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

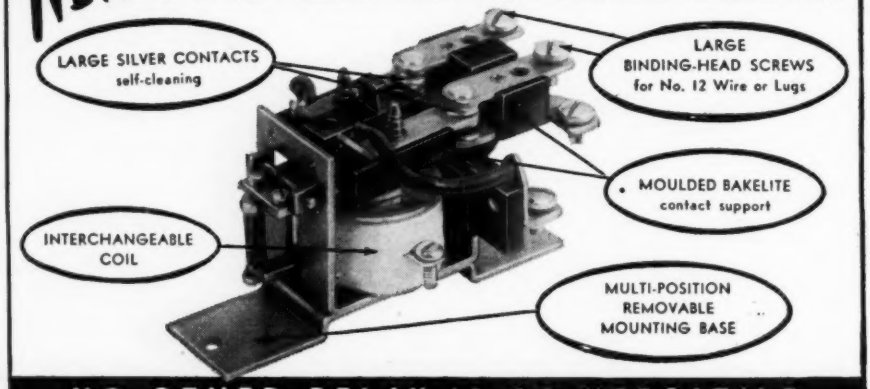
Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



For Information, Contact Your Supply House, or

DUO-SAFETY LADDER CORP.
809 Ninth Street • Oshkosh, Wisconsin

NEW **GENERAL PURPOSE RELAY**
(SERIES 130 RELAY)
THE MOST USEFUL RELAY FOR INDUSTRIAL APPLICATION



NO OTHER RELAY IS SO VERSATILE

SPECIFICATIONS

CONTACTS	RATINGS	COILS	MOUNTING BASE
Single-and-double pole	20 amp. at 115 V	AC & DC to 230 V	Metal strap or bakelite. Base can be rotated 90 degrees either direction for mounting convenience.
Single-and-double throw	60 Cy. AC or 24 V DC	(Interchangeable)	
Aux. DT contacts available	U.L. Approved	Power—2 watts	

DIMENSIONS Base—1" x 3⅞"

Request complete data on Series 130 Relay.

Wheelock SIGNALS INC
RELAYS W S LONG BRANCH, N. J.

Pa. Independent Places $500,000 Stock Issue

North Pittsburgh Telephone Co., Gibsonia, Pa., on May 13 was reported to have placed $500,000 principal amount ($100 par value) of cumulative preferred stock.

Fidelity Mutual Life Insurance Co. purchased $300,000 and Berkshire Life Insurance Co., $200,000. The purpose was to finance a portion of the company's expansion and modernization program.

The sale was arranged through Arthurs, Lestrange & Co. of Pittsburgh.

New Assignments for Seven Army Signal Corps Officers

New field assignments for seven Army Signal Corps senior officers have been announced by Maj. Gen. J. D. O'Connell, Chief Signal Officer of the Army. The new assignments will be effective during June and July.

Maj. Gen. W. Preston Corderman, Deputy Chief Signal Officer, will go to Fort Monmouth, N. J., replacing Maj. Gen. Victor A. Conrad, Commanding General, Fort Monmouth, who has been assigned to the U.S. Army Element, SHAPE, Paris, France.

Brig. Gen. Ralph T. Nelson, Commandant, Southeastern Signal School, Fort Gordon, Ga., will go to Fort Huachuca, Ariz. He will be replaced by Col. David P. Gibbs, who is presently Signal Officer, Continental Army Command, Fort Monroe, Va.

Brig. Gen. William M. Thames, Deputy Commanding General, Fort Huachuca, is to be assigned to the U. S. Army Combat Surveillance Agency, Washington, D. C.

Col. E. L. Littell, Comptroller, Office of the Chief Signal Officer, will assume command of the U. S. Army Signal Supply Agency, Philadelphia, Pa. Brig. Gen. William D. Hamlin, presently commander of USASSA, has been assigned to U. S. Army, Europe.

New Microwave Ferrites Developed at Bell Labs

New ferrite materials having properties particularly well adapted for a broad range of microwave applications have been developed by L. G. Van Uitert of Bell Telephone Laboratories. The desirable properties include controllable saturation magnetization, low dielectric loss, and a high degree of reproducibility.

Many novel microwave circuit elements have grown out of Bell Telephone Laboratories' development of the microwave gyrator in 1951. These new

XUM

devices depend on the high frequency magnetic behavior of ferrites and utilize ferromagnetic resonance in insulating magnetic materials.

This and other new applications of ferrites followed a general upsurge of interest in magnetic oxides stimulated by developments at the Philips Laboratories in the Netherlands.

The new ferrite materials constitute a forward step in production of the unique nonreciprocal microwave devices in which solid materials themselves perform complex circuit functions, and signify a new microwave epoch in ferrites.

The new materials are essentially magnesium, manganese, aluminum ferrites or nickel manganese ferrite with a small amount of copper replacing some of the magnesium or nickel.

The addition of the proper quantities of copper and manganese to the basic ferrite is advantageous from several points of view.

By increasing the reactivity of the mixture, copper decreases the necessary firing temperature by at least 100°C. Under comparable conditions this results in lower porosity and improved uniformity in the fired material.

The manganese addition decreases electrical conductivity and thus the dielectric losses in these low porosity materials.

Microwave ferrites with low saturation magnetizations are obtained by the modification of magnesium ferrite. The saturation magnetization of this ferrite can be decreased in a controlled way by substituting aluminum for a part of the iron.

While materials compounded in this fashion are basically satisfactory, their refractory nature makes it difficult to reproduce the magnetic properties required for many microwave applications. The added copper minimizes this difficulty, and also increases slightly the Curie temperature for comparable saturation magnetization.

Microwave measurements on these new ferrites indicate that in general they are comparable to or better than similar materials containing no copper. Applications include microwave gyrators, isolators, and similar devices.

AT&T's Craig Resigns As Board Chairman

The American Telephone & Telegraph Co. announced on May 15 the resignation of Cleo F. Craig as chairman of the board, effective May 31.

He will continue as a director of the company and as a member of the executive committee.

Telephone batteries engineered for—

extra-dependable power . . . plus!

C & D PlastiCell®

Extra-dependable packaged power! Extra advantages, too!

The best "salesmen" for C & D PlastiCell® batteries, you'll find, are the large number of friends these *advanced-engineered* batteries have made among telephone men in important exchanges across the country. C & D PlastiCell telephone batteries give you much more than extremely reliable power. You also get:

- **One-piece, permanently-sealed plastic case.** Entire unit is shock-resistant . . . lighter and more compact than glass or rubber.
- **More compact installations.** With smaller dimensions for a given capacity, C & D's take up less battery room space.
- **Easier maintenance.** Patented Post Seal eliminates acid creepage.
- **Lower costs.** Light plastic case reduces shipping costs . . . total in-place costs.

These plus many other benefits mean that in the telephone field, C & D is—

Your better battery buy!

Literature available

Write for complete description and specification in C & D PlastiCell Bulletin T-527

C&D **BATTERIES, INC.**

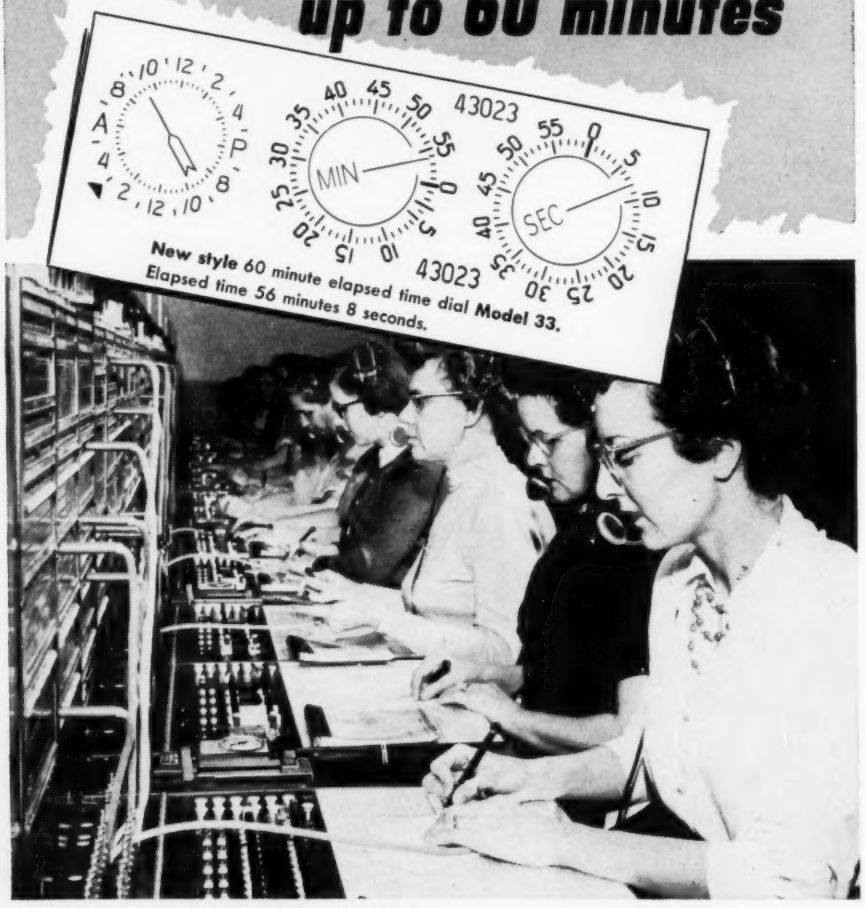
of Conshohocken, Pa.

SINCE 1906

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

CALCULAGRAPH

Now Automatically gives you accurate Toll Call Records— up to 60 minutes



New style 60 minute elapsed time dial Model 33.
Elapsed time 56 minutes 8 seconds.

Photo courtesy of Union Telephone Co., Owosso, Mich.

Now, Calculagraph, the modern dependable computer, automatically figures and prints toll calls up to 60 minutes —no need to add 30 minutes on long conversations.

Thus, Calculagraph adds one more feature to reduce human errors by busy operators and increases the volume of calls handled per operator. Assures you of all revenue due on every call.

For accurate toll call records, for automatic computation of elapsed time, for more efficient operation, install the new 60-minute elapsed time Calculagraph on your switchboard.

Information on this new Calculagraph is yours upon request.

Write today for illustrated brochure to Dept. T.

535

CALCULAGRAPH Company
HARRISON, N.J.

DEPENDABLE ELAPSED TIME COMPUTERS SINCE 1892

Five-Watt, Ten-Megacycle Transistor Developed

An experimental silicon power transistor, capable of providing an output of 5 watts at 10 megacycles either as an oscillator or an amplifier, has been developed at Bell Telephone Laboratories under the sponsorship of the Joint Services. Unilateral gain is in excess of 20 db, and a collector efficiency of better than 40 per cent has been achieved.

Details of this development were revealed in a talk prepared by Messrs. J. E. Iwersen, J. T. Nelson and F. Keywell of Bell laboratories for presentation at the National Conference of Aeronautical Electronics in Dayton, O. on May 15.

The unit is a p-n-i-p diffused emitter and base transistor, in which a near-intrinsic or "neutral" layer of silicon separates the collector from the other elements. Introduction of an intrinsic layer to improve the high-frequency performance of transistors was announced by Bell Laboratories in 1954.

Alpha cutoff is about 100 megacycles per second, and some laboratory samples have provided as much as one watt output as an oscillator at 100 megacycles per second. Input and output impedances are on the order of 20 ohms and 300 ohms, respectively.

Original design objectives have been met in the laboratory models and development work on this unit is continuing.

Steady improvements in the diffusion process, packaging, and other features are expected to result in a transistor which is highly reliable and relatively easy to manufacture.

Small Michigan Independent To Tie Into DDD Network

The Community Telephone Co. of Howard City, Mich., recently converted its exchange from magneto to Stromberg-Carlson XY dial equipment.

The company, serving less than 500 subscribers, on June 2 is scheduled to provide Direct Distance Dialing (DDD). It is understood that the Community company is the first small Independent in Michigan to adopt DDD.

Pennsylvania Company Issues $750,000 of Preferred Stock

The Commonwealth Telephone Co., Dallas, Pa., has placed $750,000 of 6 per cent cumulative preferred stock with institutional investors, it was announced on May 15.

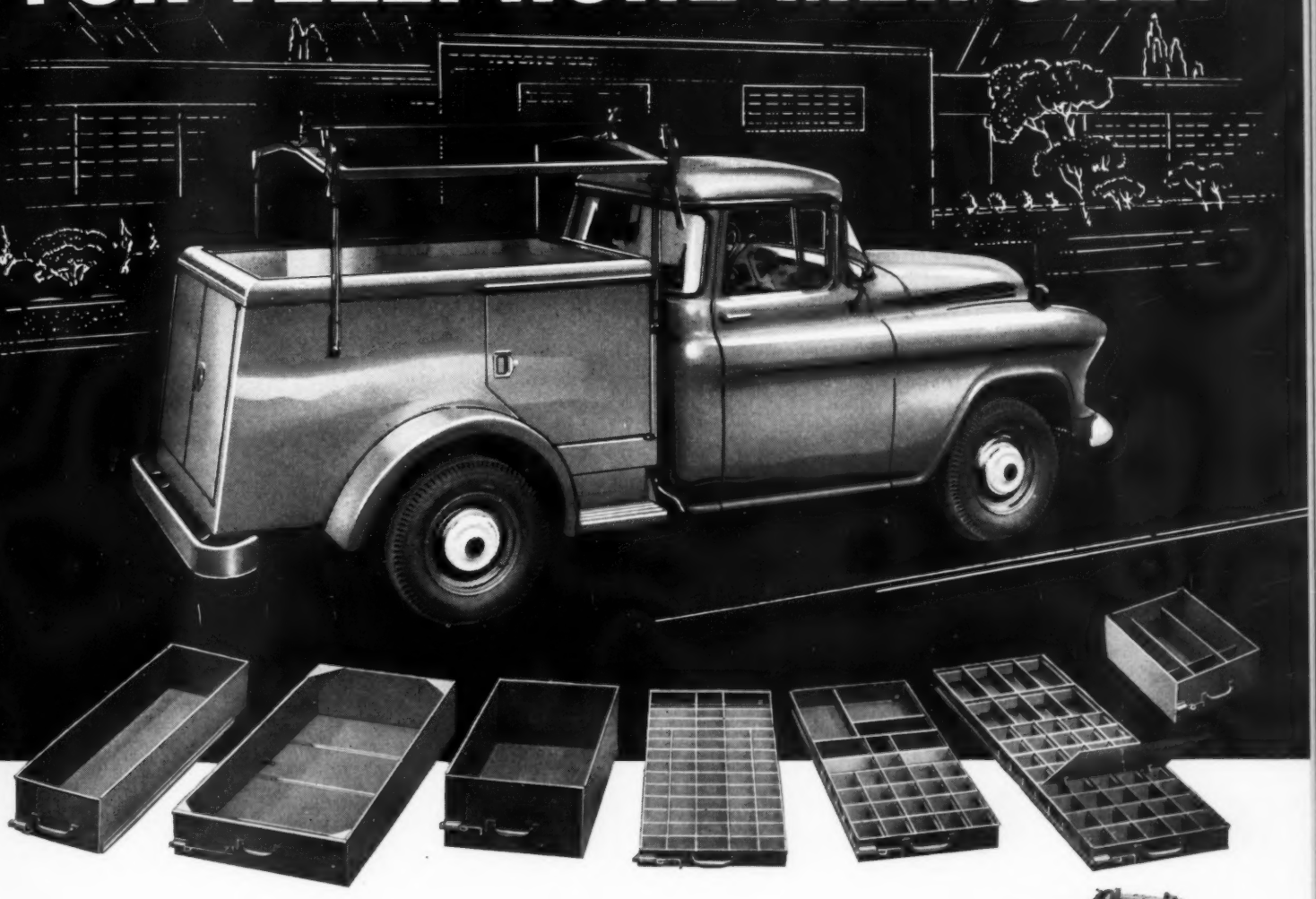
Mutual Of New York purchased one-

(Please turn to page 59)

POWERS American

Presents the SERIES GTI-76 TELEPHONE INSTALLER'S BODY

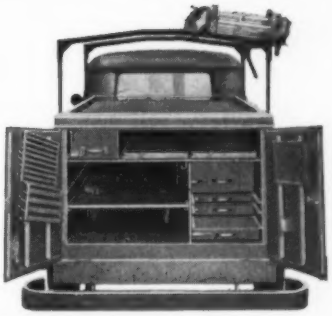
FOR TELEPHONE MEN ONLY



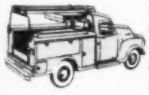
The GTI-76 Body is designed for one-trip telephone installation, maintenance, and general service work. It carries everything needed for routine or emergency jobs . . . in weathertight, pilfer-proof compartments that lock with a single key.

In addition to the seven drawers shown above, standard equipment includes shelves, racks, trays, hooks, and brackets for carrying a complete assortment of supplies.

Want details? A copy of descriptive Bulletin No. 121, with price information, is yours for the asking.



Optional equipment includes overhead rack, with brackets for ladders and/or cross arms; extension ladders; wire reel; and spotlight.



SERIES 44-CS carries a completely-equipped workshop for any telephone cable splicing operation.

SERIES 25-T has adjustable bins and shelves to carry telephone service tools and materials.

SERIES 33-T equipped to carry tools and supplies for telephone installation and service.

McCABE-POWERS AUTO BODY COMPANY

5900 NORTH BROADWAY
ST. LOUIS 15, MISSOURI

•

625 CEDAR STREET
BERKELEY 10, CALIFORNIA

If you're good —

you're very, very good

and

If you're bad —

you're horrid!

———

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third of the issue, and the remainder of the securities were shared by Fidelity Mutual Life Insurance Co., Home Life Insurance Co. of America, State Farm Mutual Automobile Insurance Co., National Life Insurance Co., and Ohio National Life Insurance Co.

Proceeds of the sale will be used to reduce outstanding bank loans. The financing was arranged by Eastman Dillon, Union Securities & Co. acting as agent for the borrower.

Announce Plan to Expand Afghanistan Communications

Under a plan to expand Afghanistan's communications system reported on May 13, Kabul and 14 principal provincial cities will receive automatic switchboards, which will be connected by additional trunk lines.

Manually operated switchboards will be installed in 48 smaller provincial towns.

The plan also provides for installation of wireless communications between Kabul and provincial capitals, it was stated.

Allied Powers Europe Plan Huge Communications Link

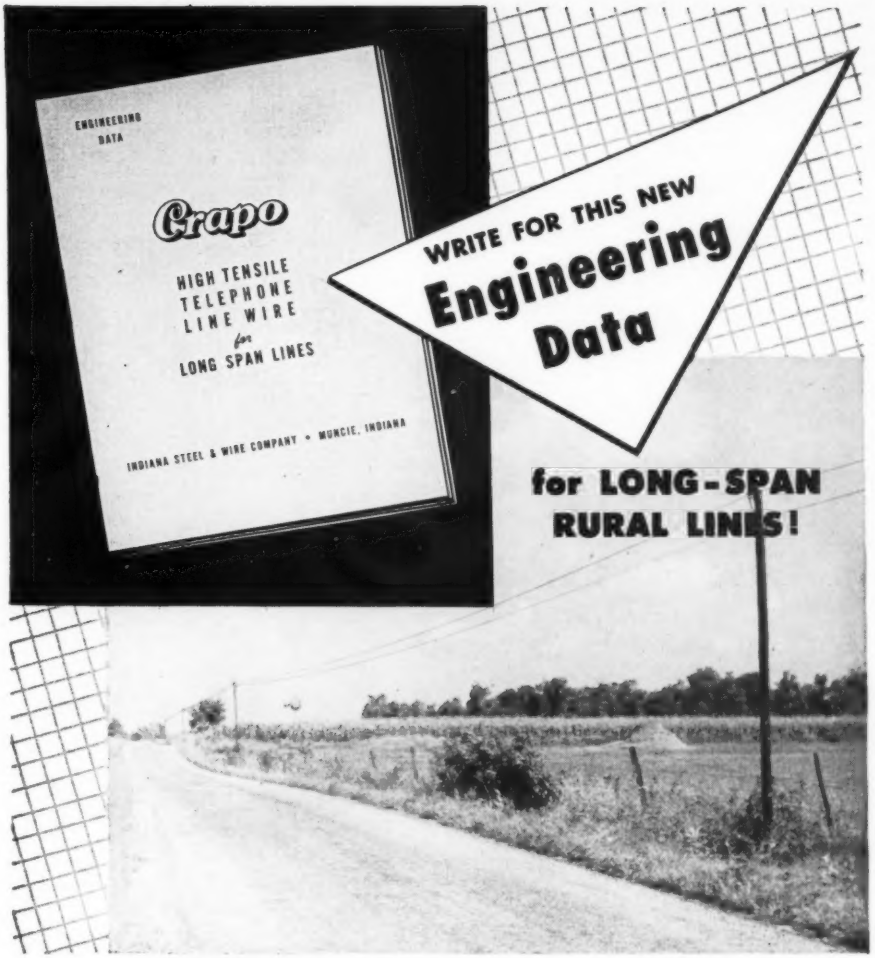
Supreme Headquarters Allied Powers Europe issued on May 9 a Letter of Intent to the International Standard Electric Corp., foreign overseas management subsidiary of the International Telephone & Telegraph Corp., including a directed subcontract to Hycon Eastern, Inc., for the engineering and installation of one of the most modern and extensive military communications systems in the world.

This new network will combine over-the-horizon tropospheric forward scatter and line-of-sight radio relay links to further integrate, from a communications viewpoint, certain international and national military agencies and installations extending from eastern Turkey around the broad crescent throughout NATO Europe to the far reaches of northern Norway.

H. H. Scudder, executive vice president, International Standard Electric Corp., and Alfred J. Poté, executive vice president of Hycon Eastern, Inc., Cambridge, Mass., signed at SHAPE for their respective companies. The combined estimated contract cost for their services is 9 million dollars.

The main center of this gigantic undertaking will be established in Paris, France. Planning, engineering, and general supervision will, in the larger part, be conducted therefrom.

In addition, there will be field teams for testing, exploration, installation,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and supervision which will be deployed in the many NATO European countries where the forward scatter and radio relay station sites are projected.

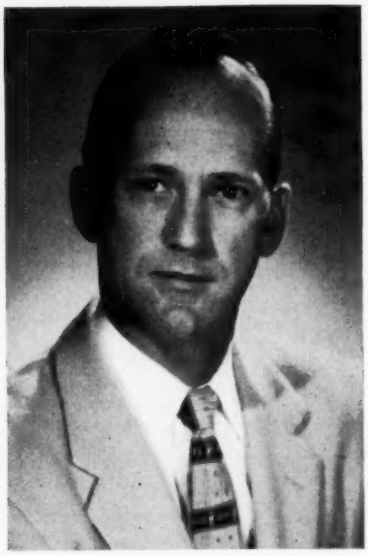
The system design will employ the most modern techniques known in the state of the communications art, it is said. Consideration is given to very high circuit reliability and to physical and electronic security in order to provide the greatest degree of transmission dependability attainable.

Among the features of this operation will be wide employment of technical personnel from among the many NATO countries, the procurement to the maximum practicable extent of equipment on an international competitive bidding basis, and the direct coordinated cooperation and participation of the respective European NATO nations.

Superior Cable Names Chenault Sales Engineer

Marvin Chenault Jr. has joined Superior Cable Corp., Hickory, N. C., as sales engineer, James H. Bowman, vice president-sales, recently announced. His headquarters will be in Dallas, Tex., and he will cover the Texas, Oklahoma and Louisiana territory.

Mr. Chenault has been associated with the cable industry in various capacities for the past 10 years. Most recently, he was employed by the Brenner Sales Corp. as a sales representative covering north Texas and Oklahoma in the building wire and cable trade.



MARVIN CHENAULT JR.

A native Texan, he was born in Wichita Falls in 1923. After graduation from Highland Park High School in Dallas, he continued his education at Southern Methodist University where he majored in engineering.

A veteran of both World War II and the war in Korea, Mr. Chenault served with the U. S. Air Force during both conflicts.

Automatic Electric Plans Record Move

Automatic Electric Co. began moving its facilities from Chicago to suburban Northlake, Ill. on May 24. The moving operation, according to the National Furniture Warehousemen's Association and the Movers' Association of Chicago, will be the largest ever undertaken in the Midwest.

Leslie H. Warner, president of Automatic Electric and chief executive officer of the manufacturing, sales and research division of the General Telephone System, said the move will be completed in about four months.

Mr. Warner emphasized that the move has been planned so that production will not be interrupted.

Various departments will be moved in reverse production line order. A fleet of trucks will be kept in almost constant service to shuttle parts from departments still operating at the old location to departments already moved to the new facilities at Northlake.

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Mr. Warner says that Automatic will double production once settled down in the new plant.

Groundbreaking ceremonies at the new plant site, which were attended by many Chicago area industrial leaders and dignitaries from the telephone field, were held on April 16, 1956.

The new Automatic Electric plant stands on the 167-acre site of a country club. The building, one of the largest industrial structures in the Middle West, will house the General Telephone Laboratories and the general offices and United States production facilities of Automatic Electric. Both organizations are parts of the General Telephone System.

All the athletic stadiums of the Big Ten conference schools would fit on the factory floor of the new plant. It contains more than 1,520,000 square feet of floor space under one roof. Present facilities of the company are spread through 17 multi-story buildings on Chicago's near west side.

Joyce Brothers Storage & Van Co. of Chicago estimates that Automatic's office furnishings, stock and raw material alone will fill 200 tractor-trailer moving vans and require 50,000 manhours just to load and unload.

In addition, Pennoyer Merchants Transfer Co. will handle the moving of some 1100 machines, weighing an estimated total of 2.6 million pounds.

Federal Telecommunication Opens Research Building

Federal Telecommunication Laboratories, the Palo Alto, Cal. branch of the Nutley, N. J. subsidiary of IT&T has moved into a new 6,000 sq. ft. research and development headquarters at 937 Commercial St., Palo Alto.

The building, just completed and of modern design provides facilities for an ultimate capacity of 50 individuals working on projects related to communication and carrier-telephone equipment and accessories for manufacture by other members of the IT&T family.

Necessitated by staff expansions to the point where the initial quarters nearby in Palo Alto had become inadequate, the new building provides space for an expanded engineering department, laboratory and model shop, machine shop, drafting and reproduction section, and administration.

Manager of the laboratory is W. S. Chaskin, long identified with the carrier-telephone and -telegraph field.

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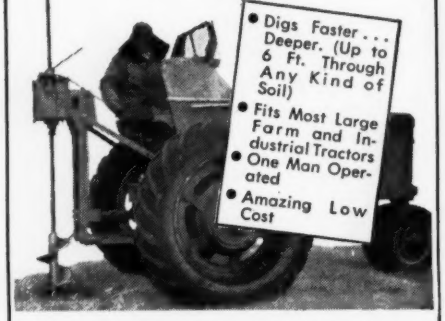
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Committee of employes presenting commemorative plaque celebrating the 100th anniversary of Mathias Klein & Sons, to Mathias Klein, president. In the group are (left to right): Arthur Chrosnik, Walter Kerkowski, Joseph Menzel, Mr. Klein and Nicholas Michels.

Employes Commemorate Klein's 100th Anniversary

One hundred years ago, in 1857, a young iron worker from Germany established his forge in the frontier village of Chicago. The blacksmith shop served also as an evening gathering place for telegraph linemen at a time when communication lines were pushing westward. The tools used were imported from Europe.

One day a lineman broke his pliers and asked Mathias Klein to make a new half. This Klein did, forging it from a bar of the finest tool steel, tempering it, sharpening it and fitting it into place.

Several months later the lineman returned with the news that he had broken the other half of the pliers. Mathias Klein then forged the second half and this was the first pair of pliers ever made by Mathias Klein & Sons.

Over the years Klein kept pace with the electrical industry developing tools and safety equipment such as climbers, grips, safety straps, tool belts, and other items.

One hundred years later, the grandson of the founder and his two sons control the company. Mathias A. Klein is president, Mathias A. Klein Jr., vice president and secretary, and Richard T. Klein, assistant secretary.

To commemorate this event, Klein employes, many of whom have been with the company from a third to a half century, designed and made a plaque which was presented to the president. This plaque reads: "1857-1957 To commemorate the 100th anniversary of Mathias Klein & Sons this plaque is presented to Mathias A. Klein Sr., with respect and gratitude from his faithful employes."

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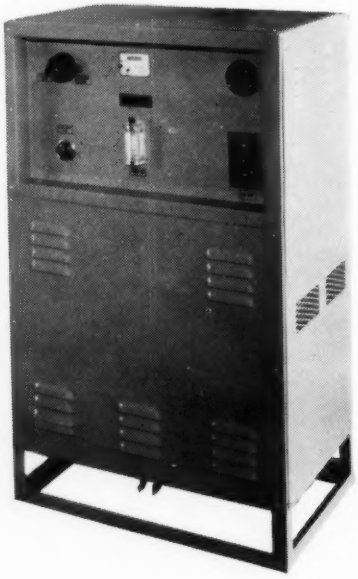

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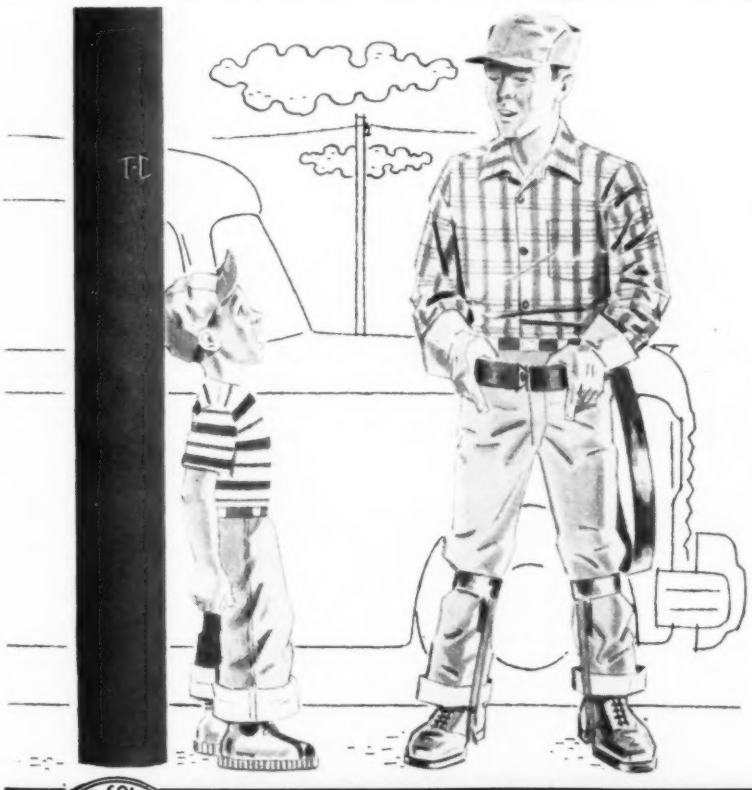

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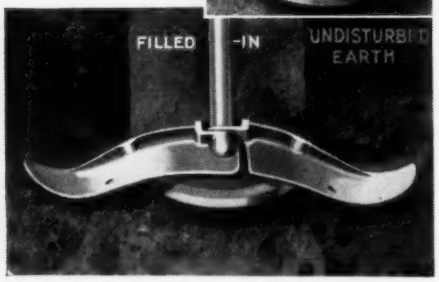

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FTL Displays Over-Horizon Microwave, Tacan Data Link

Advances in the development of radio transmission techniques were featured in Federal Telecommunication Laboratories' (FTL) exhibit at the 11th annual convention of the Armed Forces Communication & Electronics Association on May 20-22, in the Sheraton-Park Hotel, Washington, D. C.

FTL, Nutley, N. J., research division of the International Telephone & Telegraph Corp., displayed what the company called a revolutionary broad-band "over-the-horizon" microwave communication system and the recently declassified Tacan Automatic Reporting and Data Link, which it described as a powerful new tool for instantaneous and reliable air traffic control.

Operation of the new FTL-developed O/H system, capable of carrying 120 telephone conversations or a television program between stations hundreds of miles apart, was shown on a colorful 10-foot wide panel. The exhibit described a broad-band O/H link designed and engineered by FTL for single-hop transmission between Florida and Cuba.

The Tacan Data Link display included actual units of the airborne equipment and explanatory photographs. The new air navigation aid provides fully automatic data transmission between aircraft and the air traffic control centers, eliminating the delays, confusion, and inaccuracies inherent in existing "party-line" radiotelephone circuits, the company stated.

Aircraft equipped with Tacan Data Link automatically and continually report their identity, position, altitude, course, and speed to the air traffic controller and are able to originate any of a group of routine coded messages such as "request landing instructions."

At the same time, the company said, the air traffic controller can transmit flight instructions directly via the aircraft instruments to give the pilot the position, speed, heading, and altitude that will best effect uninterrupted travel to his destination.

Tacan Data Link, a further development of Tacan, was developed under contract to the U. S. Navy, which currently has it under evaluation.

Henkels & McCoy Names Burfeind Consultant

Henkels & McCoy, Philadelphia contracting and engineering firm, with branch offices throughout the United States, has recently engaged R. H. Burfeind as telephone consultant.

Mr. Burfeind was formerly associated with the Automatic Electric Co., of Chicago, until his retirement on Dec. 31, 1956.

Mr. Burfeind will assist Henkels & McCoy in telephone construction and engineering work throughout the United States and will represent the company at many state telephone conventions.

Phelps Dodge Names Manager of Philadelphia District

Richard I. Wilson has been appointed Philadelphia district manager of Phelps Dodge Copper Products Corp. and will be responsible for all sales of the fabricating company in this area, it was announced on May 14.

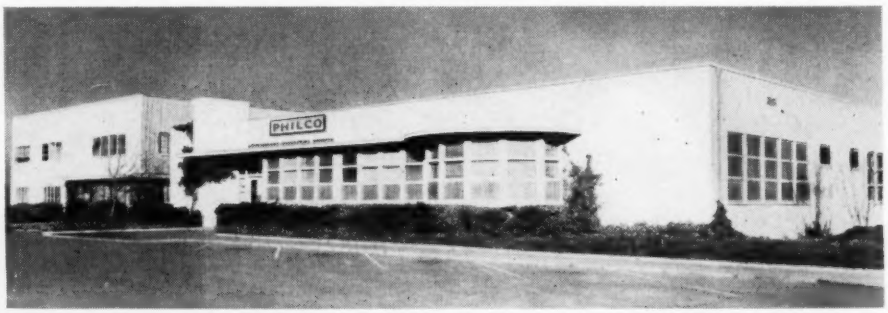
Mr. Wilson had served as a salesman for Phelps Dodge in the Philadelphia-Baltimore territory since 1935.

Open Communications System

The first portion of a half-million-dollar communications system being installed by General Electric Co. on the Massachusetts east-west turnpike system is now in operation.

Be On the Watch

"Opportunity is ever worth expecting; let your hook be ever hanging ready. The fish will be in the pool where you least imagine it to be."—Ovid.



New western development laboratories at Redwood City, Cal., recently opened by the government & industrial division of Philco Corp. Henry F. Argento, vice president and general manager of that division, announces that the laboratories will be programmed in the areas of advanced research and development in electronics and related fields.

General Dynamics Names Summer Study Winners

Six teachers in the central western zone of New York state have been named winners of summer study grants by General Dynamics Corp., it was announced on May 10 by Lynn C. Holmes, director of research and advanced development, and chairman of the grants committee at Stromberg-Carlson, administrator of the program in the Rochester area. Stromberg-Carlson is a division of General Dynamics Corp.

The awards, each of which is $500, were made by General Dynamics Corp. in recognition of the increasing need for effective teaching in the mathematical and scientific fields.

Selection of the winners was made on the basis of educational background, need for financial assistance, and future potential in the science and mathematics teaching fields.

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"Try to put well in practice what you already know; and in so doing, you will, in good time, discover the hidden things which you now inquire about. Practice what you know, and it will help to make clear what now you do not know."—REMBRANDT.

Six French Army officers touring U. S. military installations and communications equipment production centers visited Lenkurt Electric Co., San Carlos, Cal., recently. Left to right are: Maj. Gen. Edmond Combaux, Col. Jean Richy, Maj. Andre Weinis, Lt. Col. Maurice Nizart, Lt. Col. Pierre Colin, Maj. Emile Rombout, and Donald L. Barr, Lenkurt factory superintendent. Here, Mr. Barr explains assembly of signal units by operators stationed along one of the company's conveyorized production lines. Lenkurt was the only West Coast company visited by the group.

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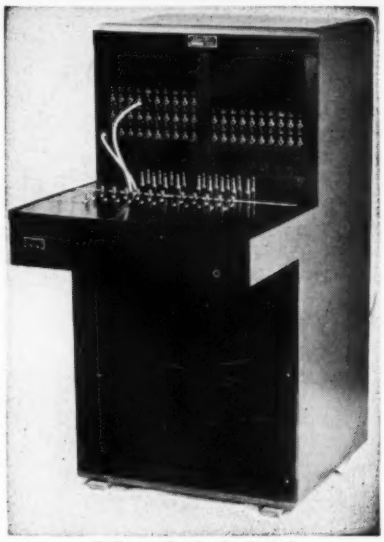
Abilene, Kans.
April 9, 1957

ALDEN L. HART,
President



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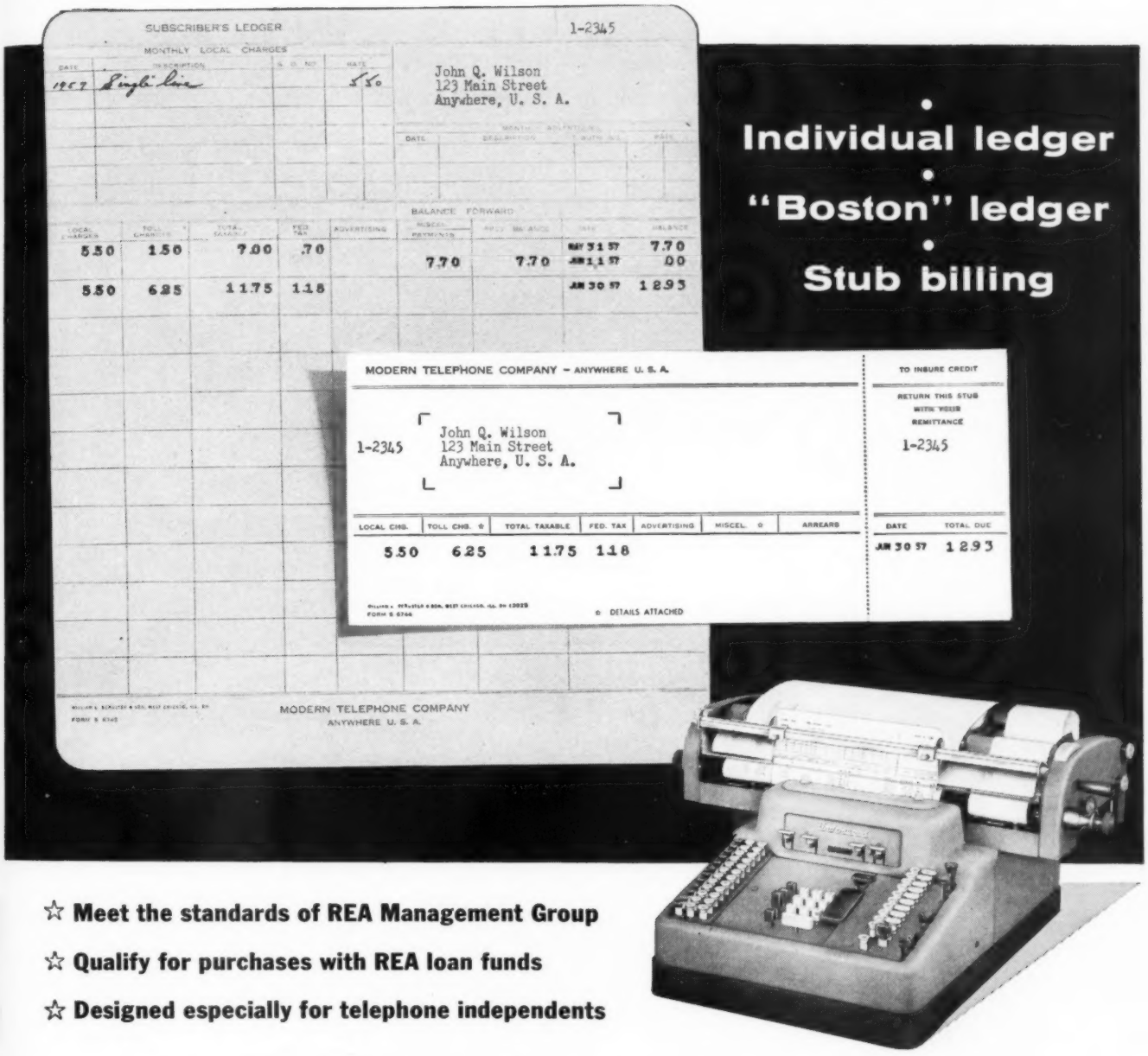

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